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DIRECTORATE OF MINORITIES

MINORITY WELFARE DEPARTMENT

QUESTION BANK

SSLC 2020-21

SCIENCE

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INDEX

1. ACIDS, BASES AND SALTS

CHOOSE THE CORRECT ANSWERS.

1. Which among the following is not a base.
(a) NaOH (b) KOH (c) NH_4OH (d) C_2H_5OH
Ans –(d) C_2H_5OH

2. To protect tooth decay we are advised to brush our teeth regularly. The nature of the tooth paste commonly used is
(a) Acidic (b) Neutral (c) basic (d) Corrosive
Ans – c) Basic

3. A solution when added to crushed egg shell, a gas is evolved that turns lime water milky. The solution contains.
(a) NH_4Cl (b) NaCl (c) KCl (d) HCl.
Ans – (d) HCl

4. The PH values of the four solutions A,B,C,D are 5,12,8,and 9 respectively. The correct decreasing order of their hydroxyl ion concentration is
(a) A>B>C>D b) D>C>B>A C) A>C>D>B d) B>D>C>A
ANS -- d) B>D>C>A

5. The P^H values of four solutions P,Q, R and S are 7.8, 1.0, 13.0, and 1.4 respectly . The solution having highest hydrogen ion concentration among them is
a)P b)Q c) R d)S
Ans --- b) Q

6. An acid that can decolourise the purple coloured potassium permanganate solution is
a) Sulphuric acid b) Citric acid c) Carbonic acid d) Hydrochloric acid.
Ans – d) Hydrochloric acid

7. Which one of the following types of medicines is used for treating indigestion?
(a) Antibiotic (b) Analgesic (c) Antacid (d) Antiseptic
Ans -- (c) Antacid

8. A solution turnsred litmus to blue its P^H is likely to be.
a) 1 b) 4 c) 5 d)10
Ans -- d)10

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9. When zinc reacts with sodium hydroxide , the liberating gas is

a) Hydrogen b) Carbon dioxide c) Chlorine d) None of these.

Ans -- a) Hydrogen

10. Use of this on Bee stung area gives relief from pain and irritation.

a) Orange juice b) Vinegar C)baking soda d) Sour milk

Ans -- C)baking soda

11. The acid present in Ant sting is

a) Oxalic acid b) Acetic acid c) Methanoic acid d) Citric acid.

Ans -- c) Methanoic acid

12. Our body works within the p^H range of

a) 5.0 to 5.6 b) 8.5 to 9.0 c) 7.0 to 7.8 d) 2.0 to 3.8

ans --- c) 7.0 to 7.8

13. Tooth decay starts when the P^H of the mouth is

a) above 5.5 b) between 7 to 5.5 c) lower than 5.5 d) none of these

Ans -- c) lower than 5.5

14. Which of the following statement is true for acids?

a) Bitter and change red litmus to blue b) Sour and change red litmus to blue

C) Bitter and change blue litmus to red D) Bitter and change blue litmus to red

Ans – b) Sour and change red litmus to blue

15. Which of the following solution is the most basic.

a)$p^H = 8.2$ B) $P^H = 9.3$ C) $P^H = 11.2$ D) $p^H = 10.5$

Ans -- C) $P^H = 11.2$

ONE MARKS QUESTION AND ANSWERS.

1.Which gas is liberated when acid reacts with metals generally?

Ans – Hydrogen gas.

2. Which type of drugs used in the treatment of indigestion?

Ans— Antacids.

3.Why does dry HCl gas not change the colour of the dry litmus paper?

Ans-- Since HCl gas gives H+ ions only with H_2O molecules to behave as an acid. The dry HCl does not change the colour of dry litmus paper as it needs moisture or water for its acidic action.

4.What is neutralization reaction?

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Ans—The reaction between an acid and base to form salt and water is called neutralization reaction
.

5. Why milk and sour food substances are not stored in copper and brass containers?

Ans – Because, milk and sour food reacts with brass and copper release hydrogen gas and some toxic substances and their by spoiling the food.

6. what are olfactory indicators? Give examples.

Ans – Some substances whose odour changes in acidic or basic media are called olfactory indicators.
Example—Onion, vanilla, clove

7. What is a strong acid?

Ans – Acids which dissociates in to ions completely is called strong acid.

8.Why do acids not show acidic behaviour in the absence of water?

Ans--- The dissociation of hydrogen ions from an acid occurs only in the presence of water.

9. Write the acids present in the following substances.
a) Vinegar b) Tomato.

Ans –a) Acetic acid
b) Oxalic acid

10. What are antacids?

Ans—Antacids are mild alkalis. These are used for getting relief from acidity and indigestion.

TWO MARKS QUESTION AND ANSWERS.

1.While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?.

Ans – The acid must always be added slowly to water with constant stirring.
If water is added to a concentrated acid
the heat generated may cause the mixture to splash out and cause burns.
The glass container may also break due to excessive local heating.

2. Compounds like alcohol and glucose which also contain hydrogen are not categorized as acids. Why?

Ans – Alcohol and glucose contain hydrogen but they do not give hydrogen ions in water and are therefore not categorized as acids.

3. How are bases different from alkalis? Are all bases alkalis? Give examples.

Ans--- Bases generate hydroxide ions in water.
Alkalies are hydroxides of metals which dissolve in water.
All bases are not alkalies. For example, Aluminium hydroxide is a base but it is not fully soluble in water and so is not an alkali.
Examples for alkalies –NaOH, KOH, $Mg(OH)_2$

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4. What is acid rain? How does it affect our aquatic life?

Ans—When the p^H of rain water is less than 5.6 it is calledas acid rain.

When acid rain flows into the rivers, it lowers the p^H of the river water. The survival of aquatic life in such rivers becomes difficult.

5.What is the reason for the acidity of soil and how can we correct it?

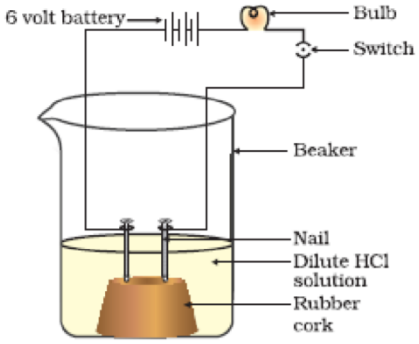
Ans--- Acidity of the soil is due to acid rain. It can be controlled by adding chalk powder or organic compounds or quick lime to the soil

.

6.Why does an aqueous solution of an acid conduct electricity?

Ans – Acids give ions in aqueous solution and in solution current is carried through ions. Thus aqueous solution of an acid conducts electricity.

7. Draw a diagram showing acid solution in water conducts electricity and labels it.



Acid solution in water conducts electricity

8.Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is Calcium chloride.

Ans -- $CaCO_3$ + 2 HCl ----------> $CaCl_2$ + CO_2 + H_2O

Calcium carbonate Hydrochloric acid Calcium chloride carbon dioxide water

9. Why does distilled water not conduct electricity, Wheras rain water does?

Ans – Distilled water cannot conduct electricity because, distilled water is a pure form of water it does not contain ions, while rain water conducts electricity as it contains ions in the form of dissolved salts.

THREE AND FOUR MARKS QUESTION AND ANSWERS.

1.What is our tooth enamel made up of ? 'Sweet tooth' may lead to tooth decay. Explain why. What is the role of toothpaste in preventing cavities?

Ans – Tooth enamel is made up of calcium hydroxyapatite (Calcium phosphate) . It starts corroding when p^H falls below 5.5.

Food particles left in the mouth degrade to produce acid which lowers the p^H of the mouth.

Toothpaste prevent tooth decay because these are alkaline and neutralize the acid produced.

2. When we overeat we feel burning sensation in the stomach. State reason. Which substance can be used to nullify its effect? Give one example, state the property due to which we fell relief.

Ans--- Over- eating produces excess of hydrochloric acid.

The excess of acid produces indigestion, burning sensation, and irritation.

This effect can be nullified by taking antacids like milk of magnesia. Being basic in nature, this will react with excess acid in the stomach and neutralize and give relief.

3. Name the followings.

a) The acid in the stinging hair of nettle leaf .

b)The chemical in the tooth enamel.

c)chemical used as antioxidant.

d) Salt is released when sodium hydroxide reacts with Zinc.

Ans – a) Methanoic acid

b) Calcium hydroxyapatite

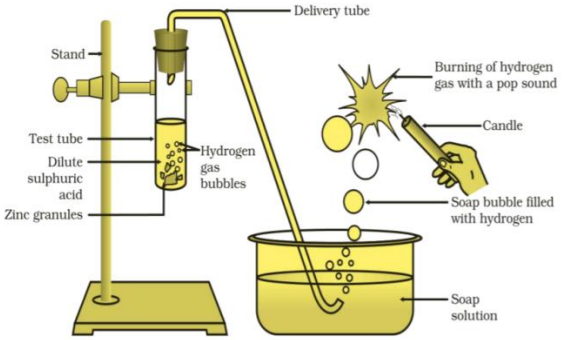
c) Magnesium hydroxide (Milk of magnesia).

d) Sodium zincate.

4. Draw a diagram showing the reaction of Zinc granules with dilute Sulphuric acid and testing Hydrogen gas by burning and label the following parts.

a) Zinc granules b) soap solution.

Ans ----



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2. METALS AND NONMETALS

MULTIPLE CHOICE QUESTIONS

1. Observe the following stages of extraction of a metal from its ore.

Sulphide ore → ☐ → Reduction → Purification

The process that has to be done in the empty space is

A. Electrolysis B. Calcination

C. Roasting D. Oxidation (Model 2021)

Answer: C. Roasting

2. The composition of Aqua regia is

A. Dil. HCl: Conc. HNO_3 3:1 B. Conc. HCl: Conc. HNO_3 3:1

C. Conc. HNO_3 : Dil. HCl 3:1 D. Dil. HCl : Conc. HNO_3 1:3

Answer: B.Conc. HCl: Conc. HNO_3 3:1

3. The type of bond that formed between chlorine and potassium is

A. Covalent bond B. Ionic bond

C. Metallic bond D. Hydrogen bond

Answer: B. Ionic bond

4. The correct pair of the metals that do not react with water is

A. Lead, copper B. Copper, iron

C. Gold, silver D. Silver, calcium

Answer: C. Gold, silver

5. The correct sequence of the given metals according to the descending order of their reactivity is

A. Cu > Fe > Al > K B. Fe > K > Al > Cu

C. K > Al > Cu > Fe D. K > Al > Fe > Cu

Answer: D. K > Al > Fe > Cu

6. The possible chemical reaction among the following is June-2019

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A. $FeSO_4 + Pb \longrightarrow PbSO_4 + Fe$ B. $ZnSO_4 + Fe \longrightarrow FeSO_4 + Zn$

C. $2AgNO_3 + Cu \longrightarrow Cu(NO_3)_2 + 2Ag$ D. $PbCl_2 + Cu \longrightarrow CuCl_2 + Pb$

Answer: C. $2AgNO_3 + Cu \longrightarrow Cu(NO_3)_2 + 2Ag$

7. The electronic configuration of element X is 2, 8, 1 and the electronic configuration of element Y is 2, 8, 7. Then the type of bond formed between these two elements is

A. Covalent bond B. Hydrogen bond (April – 2019)

C. Metallic bond D. Ionic bond

Answer: D. Ionic bond

8. Observe the following chemical equations and identify the correct statement. JULY - 2018

i) $CuSO_4 + Fe \longrightarrow FeSO_4 + Cu$

ii) $2AgNO_3 + Cu \longrightarrow Cu(NO_3)_2 + 2Ag$

A. Copper is more reactive than iron and silver.
B. Iron is less reactive than iron and silver.
C. Copper is more reactive than silver but less reactive than Iron.
D. Silver is more reactive than Copper and Iron.

Answer: C. Copper is more reactive than silver but less reactive than Iron.

ONE MARK QUESTIONS

9. Ionic compounds have high melting points. Why? 1

Answer: Because a considerable amount of energy is required to break the strong inter ionic attraction.

10. An iron ring is to be coated with copper. How can we do this without using electricity?

Answer: Iron ring should be dipped in copper sulphate solution. Iron displaces copper from copper sulphate solution and copper is coated on iron ring. ½+½

11. Food cans are coated with tin and not with zinc. Why?

Answer: Zinc is more reactive than tin.

12. Sodium, potassium and lithium are stored under kerosene oil. Why?

Answer: They are highly reactive metals and react with air and water very rapidly.

13. What are amphoteric oxides? Give two examples of amphoteric oxides. Sept 2020

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Answer: Metal oxides which react with both acids as well as bases to produce salt and water.

Ex : Aluminium oxide (Al_2O_3), Zinc oxide (ZnO)

14. State ways to prevent the rusting of iron.

Answer: Oiling, greasing, painting, galvanization (applying thin coating of zinc), chromium plating, anodization, alloying.

15. Define amalgam.

Answer: An alloy which contains mercury as one of its constituents.

16. What are ionic compounds?

Answer: The compounds formed by the transfer of electrons from a metal to a nonmetal are called ionic compounds.

17. Name the gas liberated when an acid reacts with metal.

Answer: Hydrogen

18. Silver articles when exposed to air gradually turn blackish.

Answer: Silver reacts with Sulphur in the air to form a coating of silver sulphide.

19. What are alloys?

Answer: Homogeneous mixture of two or more metals, or a metal and a non-metal.

20. Name:

Most malleable metals	Gold and silver
Most ductile metal	Gold
The best conductors of heat	Silver and copper
Liquid metal	Mercury
Liquid non-metal	Bromine
Metals with very low melting points and can melt with heat of your palm	Gallium and caesium
Lustrous non-metal	Iodine
Hardest natural substance	Diamond
Non-metal which is conductor of electricity	Graphite
Smooth metals with low melting points	Lithium, sodium and potassium
Metals that occur in free state in the earth's crust.	Gold, silver, platinum and copper
Metals that are poor conductors of heat.	Lead and mercury
The most reactive metal	Potassium
Metal which reacts with a very dilute HNO_3 to evolve hydrogen gas.	Manganese and Magnesium

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21. Hydrogen gas is not evolved when a metal reacts with concentrated nitric acid. Give reason.

(June – 2019)

Answer: HNO_3 (Nitric acid) is a strong oxidizing agent. It oxidizes the H_2 (Hydrogen) produced to water and itself gets reduced to any of the nitrogen oxides.

22. Does the chemical reaction take place when zinc is added to ferrous sulphate solution? Justify your answer.

Answer: Yes, the reaction takes place, because zinc is more reactive than the iron.

23. Chemical reaction does not take place when copper is added to iron sulphate solution.

Answer: copper is less reactive than iron.

24. Define a covalent bond.

Answer: A chemical bond formed by the mutual sharing of one or more electron pairs.

25. Name the constituents of alloys and their uses.

Alloy	Constituent metals	Special properties
Brass	Copper + Zinc	Are not good conductors of electricity. Used to make utensils.
Bronze	Copper + Tin	Are not good conductors of electricity. Used to make medals and statues.
Solder	Lead + Tin	Has a low melting point and used for welding electric wires together.
Steel	Iron + Carbon	Hard and strong. Used to make utensils.
Stainless steel	Iron + Nickel + Chromium +Carbon	Hard and does not rust

26. Copper forms a green coloured coating on the exposure to air. Give reason

Answer: Copper reacts with moist carbon dioxide in the air and slowly loses its shiny brown surface and gains a green coat.

27. How are acidic oxides formed?

Answer: Most non-metals produce acidic oxides when dissolve in water.

28. Write the balanced chemical equation for the reaction taking place when aluminium reacts with dilute hydrochloric acid. (June 2019)

Answer: $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$

29. An element X forms an oxide which turns red litmus blue. Identify whether X is a metal or non- metal.

Answer: Metal, because metal oxides are basic in nature.

30. **Which property of metals enables them to be drawn into wires?**

Answer: Ductility of metals enables them to be drawn into thin wires.

31. Name two metals which are highly resistant to corrosion.
Answer: Aluminium and zinc.
32. What is aqua-regia?
Answer: Aqua regia is a mixture of concentrated hydrochloric acid and nitric acid in the ratio of 3:1. It is highly corrosive and can dissolve noble metals like gold and platinum.

TWO MARK QUESTIONS

33. Which physical properties are used in the following situations? June 2020

i) Gold is used to make ornaments.
ii) Nickel is used in strings of guitar.

Answer: i) Shining surface / Metallic luster

Ductility

Malleability (Any two) ½+½

ii) Sonorous

Ductility ½+½

34. Which gas is released when sodium carbonate reacts with hydrochloric acid? How do you test this gas? Write the word equation for this reaction.

Answer: Carbon dioxide (CO_2)

On passing CO_2 through lime water, lime water turns milky.

Sodium carbonate + Hydrochloric acid ⟶ Sodium chloride + Carbon dioxide + Water

35. Distinguish between metals and non-metals on the basis of their physical properties.

Answer:

Metals	Non metals
1. Malleable and ductile	1. Non-malleable and non-ductile
2. Good conductors of electricity.	2. Poor or bad conductors of electricity.
3. Sonorous	3. Non sonorous
4. Are lustrous	4. Are non-lustrous

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36. Differentiate between calcinations and roasting.

Answer:

Calcination	Roasting
1. Heating carbonate ores at high temperature in the limited supply of air.	1. Heating carbonate ores at high temperature in the limited supply of air.
2. CO_2 is produced.	2. SO_2 is produced.

37. Define thermit reaction. Write its uses.

Answer: The displacement reaction of aluminium (III) with iron oxide (Fe_2O_3) is called thermit reaction.

It is highly exothermic.

Use: Used to join railway tracks and broken machinery parts.

38. Write the four properties of ionic compounds.

Answer: 1. Are solids and are somewhat hard.

2. Have high melting and boiling points.

3. Generally soluble in water.

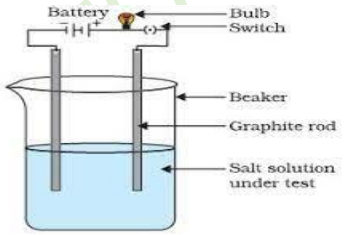
4. Conduct electricity only in the molten or aqueous state.

39. Draw a diagram to show testing the conductivity of a salt solution and label the following parts.

i) Graphite rod

ii) Salt solution under test

Answer:



40. Name any two metals which react with cold water very quickly. Write the products formed when these metals react with cold water.

Answer: Sodium, potassium and lithium

Products formed – Metal hydroxide and hydrogen gas

Ex: $2K + H_2O \longrightarrow KOH + H_2$

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41. Define the following.

i) Galvanisation ii) Anodization

Answer: i) Coating of thin layer of zinc on iron and steel is called galvanisation

ii) Coating of aluminium oxide on iron is called anodisation.

42. Mention the advantages of alloy making of iron.

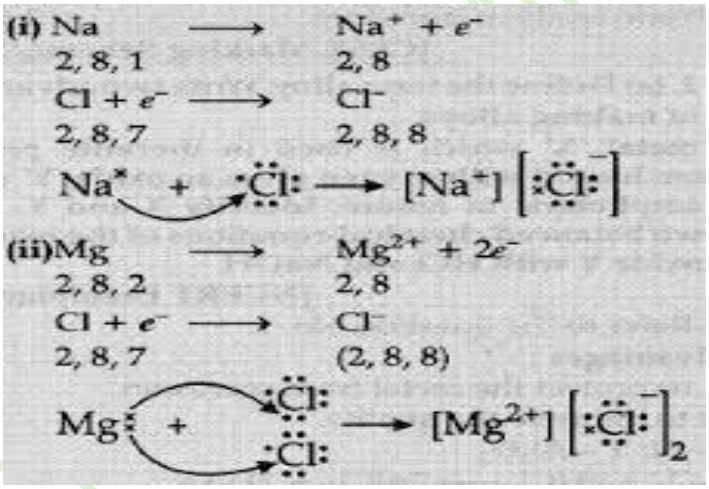
Answer: i)Pure iron is very soft and stretches easily when hot.

ii) If it is mixed with a small amount of carbon, it becomes hard and strong.

iii) When iron mixed with nickel and chromium we get stainless steel, which is hard and does not rust.

43. Show the formation of NaCl and $MgCl_2$ with the help of electron dot structure.

Answer : June 2019



44. Aluminium is a highly reactive metal, yet it is used to make utensils for cooking.

Answer: Though it is highly reactive, stable oxide layer is formed when it reacts with oxygen. This oxide layer prevents corrosion. Also it is light in weight and a good conductor of heat. Hence it is used to make utensils for cooking.

45. Carbonate and sulphide ores are usually converted into oxides during the process of extraction.

Answer: Itis easy to extract metals from their oxides by reduction rather than from their carbonates and sulphides.

46. The given equation represents by X, among Fe and Ag? Justify your answer. Write the molecular formula of the compound represented by Y. April- 2017

$CuSO_4 + X \longrightarrow Cu + Y$

Answer: Fe ½

The reactivity of Fe is more than Cu. 1

$FeSO_4$ ½

47. A metal X which is used in thermite process , when heated with oxygen gives an oxide Y which is amphoteric in nature. Identify X and Y. Write down the balanced chemical equations of the reactions of oxide Y with HCl and NaOH.

Answer: X- Al Y – Al_2O_3 1

$Al2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$ ½

$Al2O_3 + 2\ NaOH \longrightarrow 2NaAlO_2 + H_2O$ ½

48. Explain the meaning of malleable and ductile.

Answer: Malleable: It is the property of metal by which it can be beaten into thin sheet.

Ductile: It is the property of metal by which it can be drawn into thin wires.

49. In the electrolytic refining of a metal M, What should be the anode, the cathode and the electrode?

Answer: Anode –Impure metal

Cathode – Pure metal

Electrolyte – Metal's salt solution

50. Name two metals which will displace hydrogen from dilute acids and two metals which will not.

Answer: Sodium and calcium displace hydrogen from dilute acids.

Copper and silver do not displace hydrogen from dilute acids.

51. Differentiate between metals and non-metals based on their chemical properties.

Sl. No.	Metal	Non-metal
1	Metals are electropositive	Non-metals are electronegative
2	Metal + Oxygen ⟶ Metal oxide	Non-metal + Oxygen ⟶ Non-metal oxide
3	Metal + water ⟶ Metal hydroxide	Do not react with water.
4	Metal + dil. Acid ⟶ salt+ H2	Non-metal + acid ⟶ No reaction

52. Ionic compounds in solid state do not conduct electricity, whereas in molten state conduct electricity. Give reason. April-2019

Answer: In the solid state Ionic compounds do not conduct electricity, because movement of the ions in the solid is not possible due to their rigid structure, because of the strong force of attraction between the positive and negative ions. In molten state, electrostatic forces of attraction between the oppositely charged ions overcome due to heat. Thus the ions move freely to conduct electricity.

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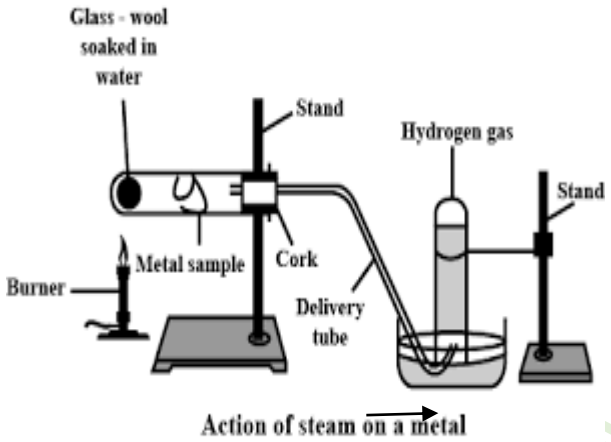
THREE MARK QUESTIONS

53. Draw the diagram of the arrangement of the apparatus showing the reaction of steam on metal. Label the following.

i) Metal sample ii) Delivery tube 3

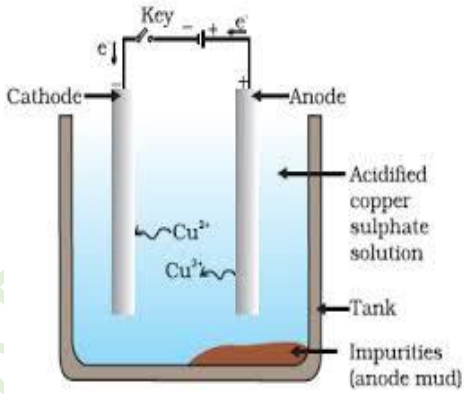
Answer :



54. Draw the diagram of the apparatus used in the electrolytic refining of copper. Label the following parts.

i) Cathode ii) Anode mud 3

Answer:



55. A metal is found in liquid state. It is widely used in instrument for measuring blood pressure. In what form does it occur in nature? How can we extract this metal from its ore?

Answer: Mercury is the metal found in liquid state. ½

It occurs in nature as sulphide ore in the form of cinnabar (HgS). ½

Mercury is heated in air and it is first converted into mercuric oxide (HgO). Mercuric oxide is then reduced to mercury on further heating. 1

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$2HgS\ (s) + 3O_2\ (g) \longrightarrow 2HgO(s) + 2SO_2\ (g)$ 1

$2HgO(s) \longrightarrow Hg\ (l) + O_2(g)$

FOUR MARK QUESTIONS

56. Mention the difference between calcinations and roasting. How these processes are used in the extraction of zinc? Explain with the help of chemical equations. After these processes is reduction necessary to obtain zinc? Why? June-2020

Answer: Carbonate ores are converted into oxides by heating strongly in limited air. This process is known as calcination. ½

Sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as roasting. ½

When $ZnCO_3$ undergoes calcinations ZnO is formed.

$ZnCO_{3(s)} \xrightarrow{heat} ZnO_{(s)} + CO_2$ 1

When ZnS undergoes roasting, ZnO is formed.

$2\ ZnS_{(s)} + 3O_{2\ (g)} \xrightarrow{heat} 2\ ZnO_{(s)} + 2\ SO_{2\ (g)}$ 1

After these processes reduction is necessary. ½

Because zinc oxide is then reduced to zinc using a suitable reducing agent. ½

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3.CARBON AND ITS COMPOUNDS

Q. No.	Multiple Choose Questions
1.	The property of self – linkage among identical atoms to form long chain compounds is known as? a) Catenation. b) Isomerisation's c) Superposition. d) Halogenations. Ans:**a) Catenation.**
2	Which of the following belongs to homologous series of alkynes? a) C_3H_8 b) C_5H_8c)C_3H_6d) C_6H_6. Ans : **b) C_5H_8**
3	The hydrocarbon that undergoes addition reaction among the follow is a) C_2H_6 b) C_3H_8c) CH_4d) C_3H_6 Ans : **d) C_3H_6**
4	An example for saturated hydrocarbon is a) C_3H_6 b) C_5H_{12}c) C_2H_2d) C_2H_4 Ans : **b) C_5H_{12}**
5	The functional groups present in propanol and propanal respectively are a) - OH and - CHO.b)- OH and - COOH.c)- CHO and - COOH.d)-CHO and - CO. Ans : **a) - OH and - CHO**
6	Identify the correct electron dot structure of nitrogen molecule in the following. (a) :N : N: (b) :N::N: (c) :N ⋮ N: (d) :N⁞⁞N: Ans : (d) :N⁞⁞N:
7	The name and the molecular formula of the saturated hydrocarbon having general formula C_nH_{2n} and containing 3 Carbon atom a) propane C_3H_8b) Cyclopropane C_3H_6 c) propyne C_3H_4d) propeneC_3H_6 Ans : **b) Cyclopropane C_3H_6**
8	Which of the following statements about graphite and diamond is true? a) They have the same crystal structure. b) They have the same degree of hardness c)They have the same electrical conductivity. d) They can undergo the same chemical reactions. Ans:**d) They can undergo the same chemical reactions.**
9	The number of covalent bonds in C_5H_{12} is a) 16. b) 18. c) 12. d) 15. Ans : **a) 16**
10	The unsaturated oil on treating with hydrogen in the presence of palladium or nickel catalyst form fats, this is an example of a) Addition reaction.b) Substitution reaction. c) Displacement reaction.d) Oxidation reaction. Ans : **a) Addition reaction**
11	Which of the given has double bond? a) Hydrogen molecule. b)Oxygen molecule. c)Nitrogen molecule d) Methane molecule Ans : **b)Oxygen molecule**

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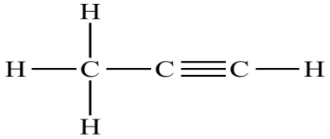
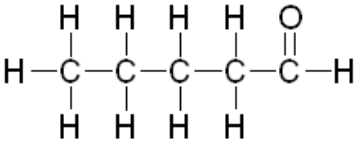
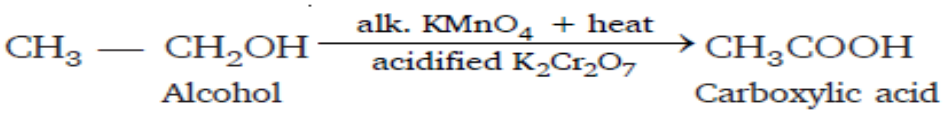
12	The Soap molecule has a a) Hydrophilic Head & a Hydrophobic tail. b) Hydrophobic Head & a Hydrophilic tail. c) Hydrophobic Head & a Hydrophobic tail.d) Hydrophilic Head & a Hydrophilic tail. Ans : **a) Hydrophilic Head & a Hydrophobic tail**
13	Which of the following cannot exhibit isomerism? a) C_4H_{10} b) C_5H_{12} c) C_2H_6d) C_6H_{14} Ans : **c) C_2H_6**
14	Two hydrocarbons 'A' and 'B' have same molecular formula C_5H_{10}. By using this statement identify the correct option. a) 'A' is a cyclic compound& 'B' is an open chain compound both has double bond. b) 'A' is a cyclic compound with single bond & 'B' is an open chain compound with double bond. c) 'A' is a cyclic compound with double bond & 'B' is an open chain compound with single bond.d) 'A' is a cyclic compound & 'B' is an open chain compound both have single bond. Ans : **b) 'A' is a cyclic compound with single bond & 'B' is an open chain compound with double bond**
15	While cooking, if the bottom of the utensil is getting blackened on the outside, it means that : a) The food is not cooked completely. b) The fuel is not burning completely. c) The fuel is wet.d) The fuel is burning completely. Ans:**b) the fuel is not burning completely.**
16	Which of the following compound on repeated chlorination forms chloroform and carbon tetra chloride? a) C_2H_6b) C_3H_8c) CH_4d) C_3H_6 Ans : **d) CH_4**
17	Which of the following is a correct name of this compound?  a) propene b) propanec) butyned) propyne Ans : **d) propyne**
18	Identify the correct name of the following compound?  a) pentanol b) pentanal c) pentanoic acidd) butanal Ans : **b) pentanal**
19	In the following reaction, alkaline KMnO4 act as :  a) Oxidising agentb) Reducing agentc) Catalystd) dehydrating agent Ans : **a) Oxidising agent**

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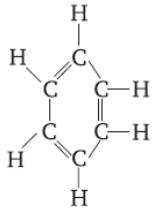
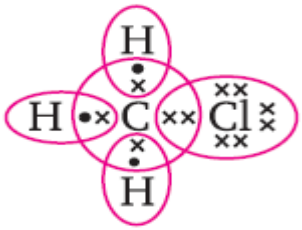
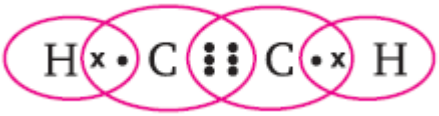
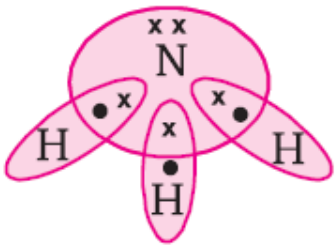
20	Why soap does not work well with hard water containing Ca^{+2} or Mg^{+2} ions. Because, a) It reacst with Ca^{+2} or Mg^{+2} to form a solution b) It reacts with oily dirt to form a white precipitate. c) It reacts with Ca^{+2} or Mg^{+2} to form a white precipitate. d) It reacts with Ca^{+2} or Mg^{+2} to form a Colloidal solution. Ans: c**) it reacts with Ca^{+2} or Mg^{+2} to form a white precipitate.**
	One Mark Questions
21	Which element exhibits the property of catenation to maximum and why? Ans:**The element is carbon. This is because of very small size of carbon atom (77 pm) and high strength of C—C bond (355 kJ mol^{-1})**
22	Which of the following belong to the same homologous series ? C_3H_8, C_4H_8, C_4H_6, C_3H_6. Ans : **C_3H_6 and C_4H_8 belong to the same homologous series which is alkenes with general formula C_nH_{2n}.**
23	Write the molecular formula of the first two members of the homologous series having functional group >C=0. Ans : These are $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$ and $CH_3-\overset{\overset{O}{\|}}{C}-CH_2CH_3$
24	(a) Name the compound CH_3COOH and identify its functional group. Ans : **ethanoic acid (acetic acid) and its function group is Carboxylic (- COOH)**
25	What is catenation? Ans: Carbon **has the unique ability to form bonds with the other atoms of carbon which gives rise to large molecules. This property of self linking is called catenation.**
26	Why covalent compounds have low melting and boiling points? Ans: **As the bond is formed by sharing of electrons between two atoms. Intermolecular forces are small between the covalent compounds. These bonds break easily.**
27	Give the reaction to show how alcohol is converted into carboxylic acid. $CH_3-CH_2OH \xrightarrow[\text{acidified } K_2Cr_2O_7]{\text{alk. } KMnO_4 + \text{heat}} CH_3COOH$ Alcohol — Carboxylic acid
28	Name the compound

	 Ans: **Benzene, C_6H_6.**
29	Can you check hard water by using a detergent? Ans : **No, it is not possible because detergents give lather with both soft and hard waters**
30	Out of butter and ground nut oil, which is unsaturated in nature? Ans:**Ground nut oil is the unsaturated in nature.**
31	Give two uses of methane gas. Ans: **(i) It is used as a fuel. (ii) It is the major component of biogas and CNG.**
32	What is isomerism? Ans: **A property in which a compound can exist in different properties (physical or chemical) but its molecular formula remains the same.**
33	Give the electron dot structure of Chloromethane (CH_3Cl). Ans: 
34	Give the electron dot structure of ethyne (C_2H_2) Ans: 
35	Give the electron dot structure of Ammonia (NH_3) Ans: 

36	Name the cyclic saturated hydrocarbon. Ans: **cyclopropane, cyclobutane, cyclopentane.**
37	Name the second member of alkynes family Give its structure? Ans: **The second member of the alkynes family is propyne. Its structural formula is** $CH_3 - C \equiv CH$
38	Name the reaction which is commonly used in the conversion of vegetable oil into fats? Ans: **Addition reaction.**
39	Define soaps? Ans: **Soaps are the sodium or potassium salts of long chain fatty acids. These are represented by RCOONa or RCOOR.**
40	Can you check hard water by using a detergent? Ans: **No, it is not possible because detergents give lather with both soft and hard waters.**
41	How do the melting and boiling points of the hydrocarbons change with increase in molar mass? Ans: **Intermolecular forces of attraction increases due to increase in molar mass, hence the melting and boiling points increase.**
	Two Marks Questions
42	Two carbon atoms cannot be linked to each other by more than three covalent bonds. Why? Ans: **When two carbon atoms are to linked by four covalent bonds their nuclei come so close to one another that the force of repulsion between them will push these apart. As a result, a stable molecule will not be formed.**
43	Differentiate between saturated and unsaturated hydrocarbons. Give one example for each. Ans:

Saturated hydrocarbon	Unsaturated hydrocarbon
1. It consists of a single bond between carbon atoms.	1. Double or triple bond between carbon atoms is present.
2. It bums with a blue flame.	2. It burns with a sooty flame.
3. Show substitution reaction	3. Show additional reaction.

	4. Less reactive Eg. CH4, Methane C2H6, Ethane	4. More reactive E.g. H2C=CH2, Ethene HC≡CH, Ethyne

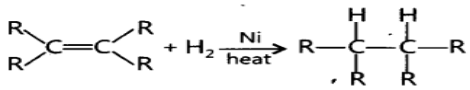
44 Differentiate between Addition and substitution reaction.

Ans:

Addition reaction	Substitution reaction
1. two or more molecule combine each other to form a single substance.	1.One atom of any other element substitutes or replaces, one of the hydrogen atoms of a given hydrocarbon.
2. Occurs only in compound containing carbon, carbon double bond or triple bond.	2. Occurs only in compound containing carbon, carbon single bond.
3. a characteristic property of unsaturated hydrocarbon.	3. a characteristic property of saturated hydrocarbon.
4. Hydrogenation of oil.	4. Halogenations of alkane.

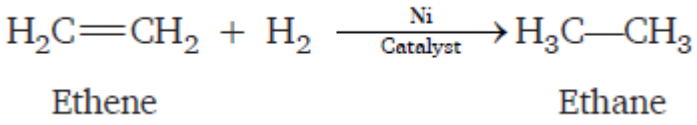
45 Name the functional group of organic compounds that can be hydrogenated. With the help of suitable example.

Double bond ═, Triple bond ≡ are functional groups (reactive part of compounds) which can be hydrogenated.



46 What is addition reaction? Give one example.

Ans: **The process of adding hydrogen across the double bonds of unsaturated hydrocarbons is called addition reaction.**



Ethene Ethane

47 What is meant by a functional group in an organic compound? Name the functional group present in

(i) CH_3CH_2OH

(ii) CH_3COOH

Ans: **(a) Functional group is an atom or group of atoms or reactive part of compound, which determines chemical properties of compounds.**

(i) —OH (Alcohol)

(ii) —COOH (Carboxylic acid).

48 Write the differences between soaps and detergents.

Ans:

Soaps	Detergent
1. Soaps are sodium salts of higher fatty acids.	1. Detergents are sodium alkyl sulphates or sodium alkyl benzene sulphonates with alkyl group having more than ten carbon atoms.
2. Biodegradable.	2. Non-biodegradable.
3. Soaps cannot be used in acidic medium.	3. They can be used in acidic medium.
4. Soaps cannot be used in hard water.	4. Detergents can be used even in hard water.

49 Differentiate between alkanes and alkenes. Name and draw the structure of one member of each.

Ans:

Alkanes:i) An alkane is a saturated hydrocarbon in which the carbon atoms are connected by only single covalent bond.

ii) General formula of alkane is C_nH_{2n+2}. iii) The simplest alkane is methane (CH_4).

iv) Alkanes generally burn in air with a blue and non-sooty flame.

v) Alkanes undergo substitution reactions.

Alkenes:

i) An alkene is an unsaturated hydrocarbon in which the two carbon atoms are connected by a double bond.

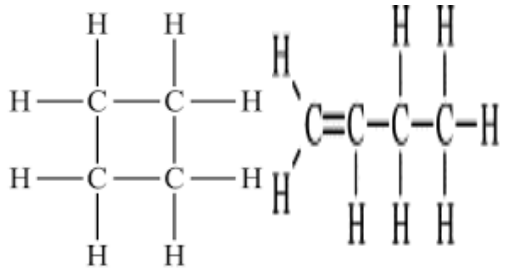
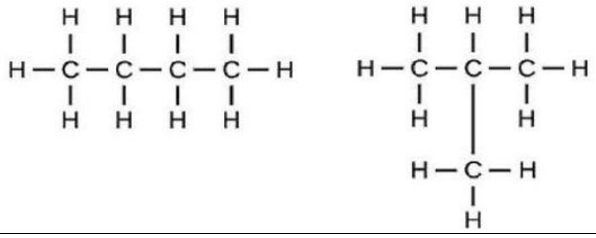
ii) General formula of alkene is C_nH_{2n}. iii) The simplest alkene is ethene (C_2H_4).

iv) Alkenes burn in air with a yellow and sooty flame.

v) Alkenes undergo addition reactions.(Any two)

50 Alkanes generally burn with clean flame. Why?

Ans: **Alkanes burn in air with a blue and non-sooty flame because the percentage of carbon in the alkane is comparatively low which gets oxidised completely by oxygen present in air.**

51	What happens when; i) ethanol is burnt in air, and ii) methane is burnt in air. Ans: i) Ethanol burns readily in air to form carbon dioxide and water vapour and releases a lot of heat and light. C_2H_5OH (Ethanol) + $3O_2$ (from air) $\longrightarrow$ $2CO_2$ + $3H_2O$ + Heat + Light ii) Methane burns readily in air to form carbon dioxide and water vapour and releases a lot of heat and light. CH_4 + $2O_2$ $\longrightarrow$ CO2 + $2H_2O$ + Heat + Light
52	The general formula of two specific group of saturated and unsaturated hydrocarbons is CnH2n. write the structures of the member of each group when n = 4. Ans: **Cyclo butane&Butene** 
	Three Marks Questions
53	What are structural isomers? Write the structural isomers of butane. Ans: **Two or more organic compounds having same molecular formula but different structural arrangement is known as structural isomers.** Butane Isobutane 
54	What is homologous series? State two characteristics of a homologous series. And find the homologous series of $C_{10}H_{20}$ molecule. Ans: **A homologous series is a group of organic compounds having similar structures and chemical properties in which the successive compound differ by $-CH_2$ group.**

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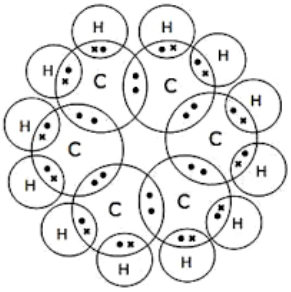
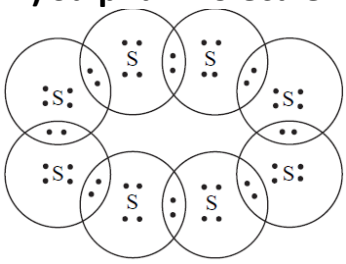
	Characteristics of a homologous series. **i) All the members have same general formula.** **ii) All the members have same chemical properties.** **iii) Any two adjacent homologues differ by $-CH_2$** **iv) Any two adjacent homologues differ by 14 u molecular mass. (any two)** **$C_{10}H_{20}$ molecule belongs to Alkene family.**
55	What is meant by a functional group? An organic compound having the molecular formula C_2H_6. Give the name and formula of the compound formed : i) When one H atom of C_2H_6 is replaced by –OH group. ii) When one H atom of C_2H_6 is replaced by –CHO group. Ans: **An atom or a group of atoms present in a molecule which largely determines its chemical properties.** **i) Name of formed compound ethanol and molecular formula C_2H_5OH.** **ii) Name of formed compound propanal and molecular formula C_2H_5CHO.**
56	Draw the electronic dot structure of i) Cyclo hexane. ii) Sulphur molecule. iii) Cyclo pentane. Ans: **i) Cyclo hexane**  **ii) Sulphur molecule.**  **iii) Cyclo pentane.**

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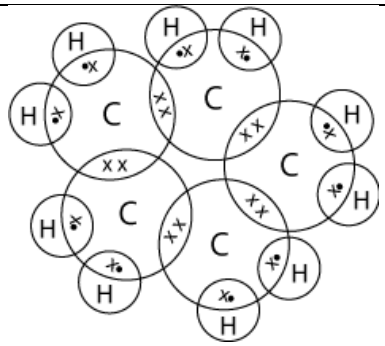


57 Write two points of difference between diamond and graphite. And why graphite can be used as a dry lubricant?

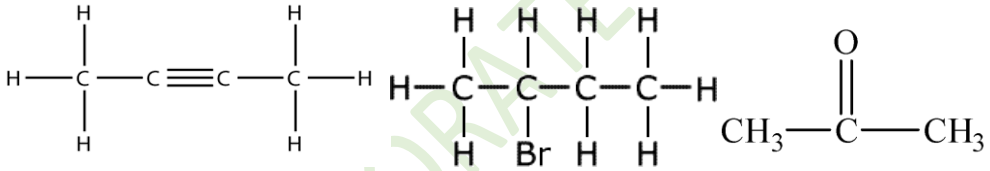
Ans:

Diamond	Graphite
i) it is a very hard substance.	i) it is comparatively soft substance.
ii) it is bad conductor of electricity.	ii) it is good conductor of electricity.
iii) it is used for making jewellery.	iii) it is used for making core of pencil leads, electrode of dry cell and black paints.

Various layers of carbon atoms in graphite are joined by weak van der Waals force, they can slide over one another. This makes it useful as a dry lubricant.

58 Write IUPAC name of following organic compounds.

i) ii) iii)



Ans:

i) 2-Butyne

ii) 2-Bromo butane.

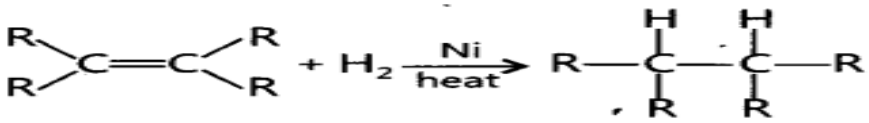
iii) Propanone.

59 Explain the addition and substitution reaction with the help of examples. CH4 undergoes substitution reaction but not addition reaction. Why?

Ans: **Addition reaction**

Unsaturated hydrocarbons combine with hydrogen atoms in the presence of catalyst to give saturated hydrocarbons.

Example: Hydrogenation of vegetable oil.



Substitution reaction

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	In the presence of sunlight other group of atoms can replace hydrogen atoms one by one form organic compounds. Example: in the presence of sunlight chlorine replaces hydrogen atom by one from methane. Methane + Chlorine $\longrightarrow$ Chloromethane + Hydrogen chloride CH_4 + Cl_2 $\longrightarrow$ CH_3Cl + HCl Because CH_4 is saturated hydrocarbon it's all 4 valence electrons are involve in bond formation with hydrogen atom. So no other atoms can be added but we can substitute by other atoms.
60	Briefly describe the mechanism of cleaning by soap. And why more amount of soap is required to clean the clothes in hard water. Why? Ans: i) The molecules of soap are sodium or potassium salts of long chain carboxylic acids. ii) The ionic end of soap interacts with water while the long chain carboxylic acids interact with oil. iii) The soap molecule thus form structure called micelles. This is an emulsion. iv) The soap micelles thus help in pulling out the dirt in water and we can wash our clothes clean. Because, the reaction of soap with calcium and magnesium salts in hard water develop scum. Hence, more amount of soap is required to clean the clothes in hard water.

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4.PERIODIC CLASSIFICATION OF ELEMENTS

Four alternatives are given for each of the following questions. Choose the correct alternative and write the complete answer along with its letter of alphabet.

1.The number of groups and periods in the modern periodic and table respectively, are

A.7 and 9 B.18 and 7

C.7 and 18 D.9 and 7

Ans: B. 18 and 7

2. The electronic configuration of element X is 2,8,8,1 and the electronic configuration of Element Y is 2, 8, 7. Then the type of bond formed between these two elements is

A. Covalent bond B.Hydrogen bond

C.Metallic bond D.Ionic bond

Ans: D.Ionic bond

3. The atomic numbers of elements A,B,C and D are 3,9,4 and 8 respectively. Elements having Metallic nature among these are

A.B and D B.A and B

C.A and C D.B and C

Ans: C. A and C

4.In modern periodic table,as we move from left to right along the period,the atomic size of the elements

A.Increases B.Does not change

C.Decreases D.First increases and then decreases

Ans: C. Decreases

5. In modern periodic table,as we move from left to right the metallic property of the elements.

A.Increases B.Does not change

C.Decreases D.First increases and then decreases

Ans: C. Decreases

6.The scientist who proposed the modern periodic table

A.Newland B.Henry Moseley

C.Dobereiner D.Mendeleev

Ans: B.Henry Moseley

ONE MARK QUESTIONS

1. State modern periodic law.

Ans: 'Properties of elements are a periodic function of their atomic number'.

2. State Mendeleev periodic law.

Ans: 'The properties of elements are the periodic function of their atomic masses'.

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3. State Newland's law of Octaves.

Ans: 'When the elements are arranged in the increasing order of their atomic mass, every Eighth element has properties similar to first one's

4. State Dobereiner law of triad.

Ans: 'When the three elements in a triad were arranged in the order of increasing atomic masses, the atomic mass of the middle element was roughly the average of the atomic masses of the other two elements'.

5.The metallic property of elements increases down the group in the modern periodic table.Why?

Ans: Down the group the effective nuclear charge experienced by the valence shell electrons Decreases because outermost electrons are farther away from the nucleus. Therefore The tendency to lose electrons will increase, hence metallic nature increase down the Group.

6.The atomic radius decreases in moving from left to right along a period.Give scientific reason.

Ans: Because due to an increase in nuclear charge which tends to full the electrons closer to the nucleus and reduces the size of the atom.

7. Sodium and Potassium are placed in the same group of modern periodic table.If the molecular formula of sodium sulphate is Na_2SO_4, then decide the molecular formula of potassium sulphate.Give reason for your answer.

Ans: * Molecular formula of potassium sulphate is K_2SO_4.

* Because both sodium and potassium have same number of valence electrons.

8.The atomic number of element 'X' is 7. Then the element belongs to which period in the Modern periodic table?

Ans: The atomic number of element 'X' 7 belongs to the 2 period of the Modern periodic table.

9.Which element is having larger atomic radius in Na,Mg,K and Ca elements?

Ans: Potassium(K) with an atomic number of 19 has the largest atomic radius.This is because

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sodium and potassium are elements of group 1.On moving from top to bottom in a group, the atomic radius increases.Mg and Ca are elements of group 2.

10.In the modern periodic table, the elements of 17th group are Flourine, Chlorine, Bromine, Iodine respectively.Which element has the highest ability to receive electrons? Why?

Ans: Flourine has highest ability to receive electrons because it is more electronegative. The effective nuclear charge acting on the valence shell electrons increases across the period, the tendency to lose the electrons will decrease so electro negativity increases across the period.

TWO MARKS QUESTIONS

1.The atomic number of an element is 20.In which the period of the modern periodic table,could this element be placed? Why? How will you decide whether the element is a metal or a non-metal?

Ans: * The atomic number of element is 20.

* It's electronic configuration is 2,8,8,2.
* It should be placed in 4th period of modern periodic table.
* It has four shells and it's highest shell number is 4.

2.How are the limitations of Mendeleev's periodic table rectified in the modern periodic table?

Ans: * In Mendeleev's periodic table, since the elements were arranged based on increasing order of atomic mass,the sequence was inverted so that the elements with the similar properties could be grouped together(For example Cobalt appeared before Nickel).Isotopes did not have any places.

* Limitations of Mendeleev's periodic table were rectified in the modern periodic table by arranging the elements in the increasing order of atomic number and also electronic configuration.
* The problem of isotopes was solved.

3.How does the atomic size vary in groups and periods of the modern periodic table?

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Why?

Ans: * Atomic size decreases down the group.

* Because new shells are being added as we go down the group, this increases the distance between the outermost electrons and the nucleus.

* The atomic size decreases on moving from left to right along a period.

* Because an increase in nuclear charge tends to pull the electrons closer to the nucleus.

4. The position of elements A, B, C, D in modern periodic table is given in the following table. Answer the following questions by observing the table:

i) Which element has the highest atomic size? Why?

ii) Which element has the least metallic property? Why?

Ans:

	Group 1	Group 2
Period 3	A	B
Period 4	C	D

i) C: New shells are added down the group (down the group, electrons enter in the new shell)

ii) B: Across the period, the tendency to lose electrons decreases (Electrons remain in the same shell)

5.How does the electronic configuration of an atom relate to its position in the modern periodic table?

Ans: In the modern periodic table, atoms with similar electronic configurations are placed in the same column. In a group, the number of valence electrons remains the same. Elements across a period show an increase in the number of valence electrons.

6.Nitrogen (atomic number 7) and Phosphorus (atomic number 15) belong to group 15

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of the periodic table. Write the electronic configuration of these twoelements. Which of these will be more electronegative? Why?

Ans: * Nitrogen Electronic configuration-2,5 * Phosphorus Electronic configuration-2,8,5

Nitrogen is more electronegative than phosphorus. On moving down a group, the

number of shells increases.Therefore, the valence electrons move away from the nucleus and the effective nuclear charge decreases.This causes the decrease in the tendency to attract electron and hence electronegativity decreases.

7.Three elements A,B and C have 3,4 and 2 electrons respectively in their outermost

shell.Give the group number to which they belong in the modern periodic table.

Ans:

Element	Valence electrons	Group number	Valency
A	3	13	3
B	4	14	4
C	2	2	2

8.Arrange the following elements in increasing order of their atomic radii,

a) Li, Be, F, N b) Cl, At,Br,I

Ans: a) F < N < Be < Li is increasing order of atomic size because atomic size decreases along

a period from left to right.

b) Cl < Br < I < At is increasing order of atomic size because atomic size increases down

the group due to increase in number of shells.

9.The elements of the second period of the periodic table are given below: Li Be B C N O F

a) Give reason to explain why atomic radii decreases from Li to F.

b) Identify the most i) metallic and ii) non-metallic element.

Ans: a) It is because nuclear charge increases due to increase in atomic number, therefore,

force of attraction between nucleus and valence electrons increases, i.e. effective

nuclear charge increases, hence atomic radii decreases from Li to F.

b) i) Most metallic element is 'Li' as it can lose electrons easily due to larger atomic size.

ii) Most non-metallic element is 'F' because it can gain electrons easily due to smallest atomic size.

10.The elements of the third period of the periodic table are given below:

Group	I	II	III	IV	V	VI	VII
Period 3	Na	Mg	Al	Si	P	S	Cl

a) Which atom is bigger, Na or Mg? Why?
b) Identify the most i) metallic and ii) non-metallic element in period 3.

Ans: a) Sodium is bigger magnesium as it has lesser nuclear charge so there is less force of attraction between nucleus and valence electrons and less effective nuclear chage.It is, therefore, bigger in size.

b) Sodium is the most metallic as it can lose electrons easily due to its larger atomic size, ii) Chlorine is most non-metallic element because it can gain electrons easily due to its smaller atomic size.

11.How can the valency of an element be determined if its electronic configuration is known? What will be the valency of an element of atomic number 9?

Ans: If the element has 1,2,3,4 valence electrons, its valency will be 1,2,3,4 respectively.

If the element has 5,6,7,8 valence electrons, its valency will be 3,2,1,0. Element With atomic number 9 has electronic configuration 2,7. So, its valency will be 1.

12. On the basis of electronic configuration, how will you identify the first and the Last element of a period?

Ans: First element has 1 valence electron and last element has 8 valence electrons.

Number of shells remain the same in the same period.

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13.How does the valency of elements vary

a) in going down a group, and

b) in going from left to right in a period of the periodic table?

Ans: a) Valency remains the same in a group.

b) valency first goes on increasing from left to right in a period till middle of period, then decreases.

14.In the periodic table, how does the tendency of atoms to loose electrons change on going from 1) left to right across a period? 2) top to bottom in a group?

Ans: 1.Tendency to lose electrons decreases from left to right across a period.

2. Tendency to lose electrons increases from top to bottom in a group.

15. Give reasons : 1.Elements in a group have similar chemical properties.

2.Elements of group I form ions with a change of +1.

Ans: 1.Elements in a group have same number of valence electrons and same valency therefore have similar chemical properties.

2. It is because elements of group 1 lose one electron to acquire + 1 charge and Become stable.

16.Why do all the elements of the a) same group have similar properties,

b) same period have different properties?

Ans: a) Elements of the same group have similar properties due to same number of valence electrons,therefore,they have same valency.

b) Elements of sane period have different properties as they differ in number of valence electrons.

17.An element has atomic number 13.

a) What is the group and period number to which this element belongs?

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b) Is this element a metal or a non-metal? Justify your answer.

Ans: a) It belongs to group 13 and 3rd period.

b) It is a metal because it can lose 3 electrons to become stable.

THREE MARKS QUESTIONS

1.The atomic numbers of two elements are 8 and 16 respectively. Write the electronic configuration of these two elements. Do you keep these two elements in the same group of the modern periodic table ? Justify your answer. Find out which of these two elements is more electronegative. Give reason for your answer.

Ans: * Atomic number 8 --- 2,6 * Atomic number 16 --- 2,8,6

* Yes, these two elements belong to the same group.

* Because in the outermost shell they have same number of electrons or both have same number of valence electrons.

* Elements with atomic number 8 is more electronegative than the element with atomic number 16 .

* Electronegativity decreases down the group.

2.Observe the given table and answer the following question :

Elements	A	B	C	D	E
Atomic number	11	4	2	7	19

Identify the two elements that belong to the same period and the two elements that belong to the same group. Give reason for your answer.

Ans: * Element B and element D are in same period because their atoms have two shells.

* Element A and element E are in the same group because their outermost shell has one electron.

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3.Explain the limitations of Mendeleev's periodic table.

Ans: Limitations of Mendeleev's periodic table are :

1.No fixed position can be given to hydrogen in the periodic table.

2.Isotopes of all elements posed a challenge to Mendeleev periodic table.

3.The atomic masses do not increase in a regular manner in going from one element to the next. So it was not possible to predict how many elements could be discovered between two elements- especially when we consider the heavier elements.

4.No distinguish positions to metals and non-metals.

4. Write the Advantages of Mendeleev's periodic table

Ans: Advantages of Mendeleev's periodic table are :

1.He left gap for some undiscovered elements. Ex: Eka Boron etc.

2.This table also accommodate the noble gases.

3. Also corrected the atomic masses of certain elements.

4.The elements with similar properties could be grouped together. Ex: Co and Ni

5. Explain the limitations of Newland's law of Octaves.

Ans: Limitations of Newland's law of Octaves are :

1.The law of octaves does not help in classifying all the known elements and it is only applicable upto calcium only.

2.After calcium every eight element did not possess properties similar to that of the first.

3.It was assumed by Newlands that only 56 elements exist in nature and no more elements were discovered in the future. But later on several new elements were discovered, whose properties did not fit into the law of octaves.

4.In order to fit elements into his table Newlands adjusted two elements in the same slot, but also put some unlike elements under the same note.

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5.LIFE PROCESSES

Multiple choice questions

1. Which plant tissue transports water and minerals from the roots to the leaf?

(a) Xylem (b) Phloem
(c) Parenchyma (d) Collenchyma

Answer: a

2. The movement of food in phloem is called:

(a) transpiration (b) translocation
(c) respiration (d) evaporation

Answer: b

3. A blood vessel which pumps the blood from the heart to the entire body:

(a) artery (b) capillary
(c) Vein (d) Haemoglobin

Answer: a

4. Name a circulatory fluid in the human body other than blood.

(a) Platelets (b) RBC
(c) Lymph (d) Plasma

Answer: c

5. Single circulation, i.e., blood flows through the heart only once during one cycle of passage through the body, is exhibited by which of the following:

(a) hyla, rana, draco (b) whale, dolphin, turtle
(c) labeo, chameleon, salamander (d) hippocampus, exocoetus, anabas

Answer: d

6. Name the tube which connects the kidneys to the urinary bladder.

(a) Urethra (b) Nephron
(c) Tubule (d) Ureter

Answer: d

7. Which part of nephron allows the selective reabsorption of useful substances like glucose, amino acids, salts and water into the blood capillaries?

(a) Tubule (b) Glomerulus
(c) Bowman's capsule (d) Ureter

Answer: a

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8. Where is the dirty blood in our body filtered?

(a) Heart (b) Lungs

(c) Ureter (d) Kidneys

Answer: d

9. The procedure used for cleaning the blood of a person by separating urea from it is called:

(a) osmosis (b) filtration

(c) dialysis (d) double circulation

Answer: c

10. Identify the correct path of urine in the human body.

(a) Kidney → urinary bladder → urethra → ureter

(b) Urinary bladder → ureter → kidney → urethra

(c) Kidney → ureter → urethra → urinary bladder

(d) Kidney → ureter → urinary bladder → urethra

Answer: d Kidney → ureter → urinary bladder → urethra

11. Blood consist of what fluid medium?

(a). Lymph (b). Platelets

(c). Plasma (d). All of these

Answer: c

12. One cell-thick vessels are called

(a). Arteries (b). Veins

(c). Capillaries (d). Pulmonary artery

Answer: c

14. The kidneys in human beings are a part of the system for

(a) nutrition. (b) Respiration.

(c) Excretion. (d) Transportation.

Answer: c

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15. The xylem in plants are responsible for

(a) transport of water. (b) Transport of food.

(c) Transport of amino acids. (d) Transport of oxygen.

Answer:a

16.The only artery which carries deoxygenated blood is:

a. Pulmonary artery b. Renal artery

c. Hepatic artery d. Coronary artery

Answer: a

17. How many chambers does a frog's heart have?

How many chambers does a frog's heart have?

a. 1 b. 2 c. 3 d. 4

Answer: c

18.Oxygenated blood reaches heart by

a. Pulmonary artery b. Pulmonary vein

c. Aorta d. Vena cava

Answer: b

19.Which of the following substances is transported by blood plasma?

a. Food b. Potassium

c. Alcohol d. All of these

Answer: d

20.How many chambers are present in human heart?

a. One b. Two c.Three d. Four

Answer: d

21.In humans, right auricle receives_____blood from_____

a. Oxygenated, aorta b. Deoxygenated, vena cava

c. Oxygenated, vena cava d. Deoxygenated, aorta

Answer: b

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22.Veins have valves to

a. Prevent back flow of blood
b. Prevent the collapse of the vein
c. Maintain its position in the body
d. None of these

Answer: a

23. The color of blood plasma is:

a. Red
b. Pale yellow
c. Yellowish green
d. Pink

Answer: b

24.It helps in translocation of food in plants.

a. Xylem
b. Palisade cells
c. Root hairs
d. Phloem

Answer: d

25. Where does the maximum exchange of material between blood and surrounding cells occur?

a. Heart
b. Veins
c. Arteries
d. Capillaries

Answer: d

26. The only reptile having 4- chambered heart is:

a. Snake
b. Turtle
c. Lizard
d. Crocodile

Answer: d

27.Superior and inferior vena cava respectively carries blood from

a. Upper and lower parts of body
b. Lower and upper parts of body
c. Upper and lateral parts of the body
d. Lateral and lower parts of the body

Answer: a

One mark questions

1. Name the term for transport of food from leaves to other parts of plants.

Answer:

Translocation of food.

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2. What process in plants is known as transpiration ?

Answer:

It is loss of water in the vapour form from the exposed parts of a plant.

3.Name the tissue which transports soluble products of photosynthesis in a plant.

Answer:

Phloem.

4.Name the tissue which transports water and minerals in a plant.

Answer:

Xylem.

5.Name the process in plants where water is lost as water vapour.

Answer:

Transpiration.

6. What is translocation in plants ?

Answer:

Translocation is passage of food materials in solution form in plants from the region of their supply or manufacture to the region of their use or storage.

7.What is the purpose of sending blood to the kidney for filtration?

Answer:

For removal of nitrogenous wastes, excess salts and some toxins.

8.How does transport of water occur at night in the absence of transpiration?

Answer: Due to root pressure and partly to meet daytime water deficit of aerial parts.

9. State the purpose of making urine.

Answer:

Extract the soluble waste products from the blood for expulsion out of the body.

10.Ventricles have thicker muscular walls than atria. ,Give reason.

Answer: Ventricles have to pump blood forcefully so as to reach even distant capillaries, right ventricle into lungs and left ventricle to all the remaining body parts, while atria are to pump blood into adjacent ventricles.

11. Name the components of blood which transport

1. **Food, carbon dioxide and nitrogenous wastes**
2. **Oxygen.**

Answer: 1. Blood Plasma. Food, CO_2 and nitrogenous wastes.

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2. Erythrocytes (Haemoglobin). Oxygen.

12.What is excretion ? How do unicellular organisms remove their wastes ?

Answer:

Excretion is the biological process of removal of harmful metabolic waste products from the body.
In unicellular organisms, excretion occurs through simple diffusion from the surface.

13. Major amount of water is selectively reabsorbed by the tubular part of nephron in humans. What are the factors on which the amount of water reabsorbed depends?

Answer:

1. Amount of excess water present.
2. Amount of dissolved wastes to be excreted.

14. Which mechanism plays an important role in transportation of water in plants

(a) During daytime

(b) At night

Answer:

(a) Transpiration pull

(b) Water deficit of daytime and afterwards root pressure.

15. Name the red pigment carrying oxygen in blood.

Ans. Haemoglobin

16. During contraction of heart, what prevents backflow of blood?

a) Thin walls of atria

b) Thick muscular walls of ventricles

c) Valves in heart

d) All of the above

Ans. c) Valves in heart

17. Name excretory organ in amoeba and earthworm

Ans. Amoeba – Cell membrane

Earthworm – Outer covering (skin)

18. Name the largest artery of body.

Ans. Aorta

19. Which of the four chambers of the human heart has the thickest muscular walls?

Ans. Right ventricle.

20. What do you mean by double circulation of blood?

Ans. Blood passes through the heart twice for each cycle of the body.

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Two mark questions

1. What are the components of the transport system in human beings? What are the functions of these components?

Answer: The main components of the transport system in human beings are the heart, blood, and blood vessels.

→ Heart pumps oxygenated blood throughout the body. It receives deoxygenated blood from the various body parts and sends this impure blood to the lungs for oxygenation.

→ Blood helps in the transport of oxygen, nutrients, CO_2, and nitrogenous wastes.

→ The blood vessels (arteries, veins, and capillaries) carry blood either away from the heart to various organs or from various organs back to the heart.

2. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Answer

- It is necessary to separate oxygenated and deoxygenated blood to maintain efficient supply of oxygen into the body.
- This system is essential in animals that have high energy need.
- For example, animals like mammals and birds which constantly use this energy to maintain their body temperature.

3. What are the components of the transport system in highly organised plants?

Answer

- In highly organised plants, there are two different types of conducting tissues - xylem and phloem.
- Xylem conducts water and minerals obtained from the soil (via roots) to the rest of the plant.
- Phloem transports food materials from the leaves to different parts of the plant body.

4. How is food transported in plants?

Answer

- Phloem transports food materials from the leaves to different parts of the plant.
- The transportation of food in phloem is achieved by utilizing energy from ATP which helps in creating osmotic pressure that transport food from the area of high concentration to low concentration.

5. What are the methods used by plants to get rid of excretory products?

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Answer

Plants can get rid of excess of water by transpiration. Waste materials may be stored in the cell vacuoles.. ,. or as gum and resin, especially in old xylem. It is also stored in the leaves that later fall off.

6. How is the amount of urine produced regulated?

Answer

- The amount of urine produced depends on the amount of excess water and dissolved wastes present in the body.
- Some other factors such as habitat of an organism and hormone such as Anti-diuretic hormone (ADH) also regulates the amount of urine produced.

7. What would be the consequences of a deficiency of haemoglobin in our bodies?

Answer

- Haemoglobin is the respiratory pigment that transports oxygen to the body cells for cellular respiration.
- Therefore, deficiency of haemoglobin in blood can affect the oxygen supplying capacity of blood.
- This can lead to deficiency of oxygen in the body cells. It can also lead to a disease called anaemia.

8. Describe double circulation in human beings. Why is it necessary?

Answer

- During a single cycle blood goes twice in the heart which is known as double circulation.

It is necessary in human being to separate oxygenated and de-oxygenated blood because this makes their circulatory system is more efficient and helps in maintaining constant body temperature

9. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Answer

i.) Helpstomaintainsbody temperature.
ii.) ii)ensures efficient supply of oxygen tothe body.

10. How is food transported in plants?

Answer: Transport of soluble productsof photosynthesis called **translocation**.

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- Phloem transports food materials from the leaves to different partsof the plant body.
- The transportation of food in phloem is achieved byutilizingenergyfrom ATP.
- The translocation of food and othersubstances takes place in the sieve tubes with the help ofadjacent companion cellsboth in upward and downward directions

11. "The body temperature of frogs and lizards depend on temperature in the environment" justify. (March 2020)

Answer

- Both frogs and lizards have three chambered heart
- Oxygenated and deoxygenated blood mix in the heart
- Production of energy became slightly less. This energy cannot be used for maintaining constant temperature

12. Explain the process of translocation of food materials in plants (April 2019)

Answer

- Translocation of food materials occurs in the phloem tissue of plants.
- This process takes place in the sieve tubes with the help of adjacent companion cells both in upward and downward directions.
- This process is achieved by osmatic pressure.

Three marks questions

1. How are water and minerals transported in plants?

Answer

- Water and minerals are transported through xylem cells from soil to the leaves.
- The xylem cells of roots stem and leaves are interconnected to form a conducting channel that reaches all parts of the plant.
- The root cells take ions from the soil. This creates a difference between the concentration of ions of roots and soil.
- Therefore, there is a steady movement of water into xylem. An osmotic pressure is formed and water and minerals are transported from one cell to the other cell due to osmosis.
- The continuous loss of water takes place due to transpiration. Because of transpiration, a suction pressure is created as a result of which water is forced into the xylem cells of roots.
- The effect of root pressure for transportation in plants is more important in night while during day time transpiration pull becomes the major driving force.

2. What are the differences between the transport of materials in xylem and phloem?

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Xylem	Phloem
Xylem tissue helps in the transport of water and minerals.	Phloem tissue helps in the transport of food.
Water is transported upwards from roots to all other plant parts.	Food is transported in both upward and downward directions.
Transport in xylem occurs with the help of simple physical forces such as transpiration pull.	Transport of food in phloem requires energy in the form of ATP.

Answer

3. Compare the functioning of alveoli in the lungs and nephrons in the kidneys with respect to their structure and functioning.

Alveoli	Nephrons
Structure	**Structure**
Alveoli are tiny balloon-like structures present inside the lungs.	Nephrons are tubular structures present inside the kidneys.
The walls of the alveoli are one cell thick and it contains an extensive network of blood capillaries.	Nephrons are made of glomerulus, bowman's capsule, and a long renal tube.
Function	**Function**
The exchange of O2 and CO2 takes place between the blood of the capillaries that surround the alveoli and the gases present in the alveoli.	The blood enters the kidneys through the renal artery. The blood is entered here and the nitrogenous waste in the form of urine is collected by collecting duct.
Alveoli are the site of gaseous exchange.	Nephrons are the basic filtration unit.

4. How are the functions of arteries, veins and capillaries are interrelated in the circulation of blood? (sep 2020)

- Arteries carry blood away from the heart to various organs of the body.On reaching an organ or tissue, the artery divides into smaller and smaller vessels to bring the blood in contact with all the individual cells.
- Exchange of material between the blood and surrounding takes place across the thin wall of smallest vessels, the capillaries. The capillaries then join together to form veins
- Veins convey the blood away from the organ or tissue. Veins collest the blood from different organs and bring it back to the heart

5.How does transportation of water takes place over the heights in a plant? (sep 2020)

Answer

- At the roots, cells in contact with the soil actively take up ions. This creates a difference in the concentration of these ions between the root and the soil.
- Water moves into the root from the soil to eliminate this difference. There is a steady movement of water into root xylem, creating a column of water that is steadily pushed upwards.
- Evaporation of water molecules from the stomata of leaves due to transportation creates s suction which pulls water from xylem cells of root.

18. List in tabular form three differences between arteries and veins.

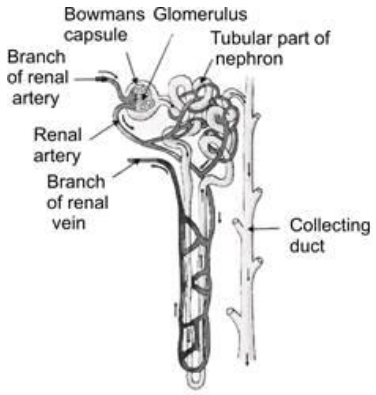
Answer.

Arteries	Veins
(*i*) Arteries carry oxygenated blood, away from the heart except pulmonary artery.	(*i*) Veins carry deoxygenated blood, towards the heart except pulmonary veins.
(*ii*) These are mostly deeply situated in the body.	(*ii*) These are superficial and deep in location.
(*iii*) These are thick-walled, highly muscular except arteries of cranium and vertebral column.	(*iii*) These are thin-walled.

Four and marks questions

19. Describe the structure and functioning of nephrons.

Answer: Nephrons are the basic filtering units of kidneys. Each kidney possesses large number of nephrons, approximately 1-1.5 million. The main components of the nephron are glomerulus, Bowman's capsule, and a long renal tubule.



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Functioning of a nephron:

→ The blood enters the kidney through the renal artery, which branches into many capillaries associated with glomerulus.

→ The water and solute are transferred to the nephron at Bowman's capsule.

→ In the proximal tubule, some substances such as amino acids, glucose, and salts are selectively reabsorbed and unwanted molecules are added in the urine.

→ The filtrate then moves down into the loop of Henle, where more water is absorbed.

→ From here, the filtrate moves upwards into the distal tubule and finally to the collecting duct. Collecting ,. duct collects urine from many nephrons.

→ The urine formed in each kidney enters a long tube called ureter. From ureter, it gets transported to the urinary bladder and then into the urethra.

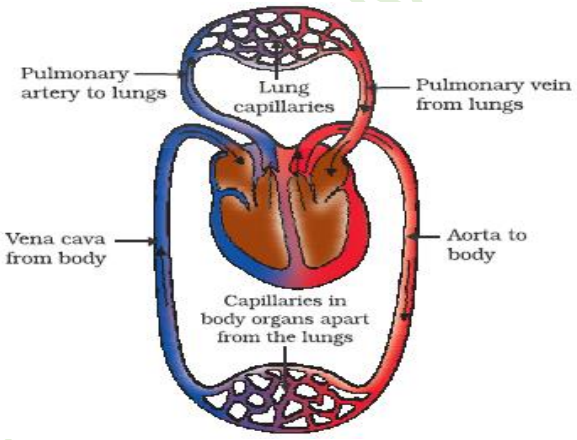
14.(a) Name the site of exchange of material between the blood and surrounding cells.

(b) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide in human body.

Answer.

(a) Capillaries

(b)



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6. CONTROL AND CO-ORDINATION

I. Multiple choice questions

1.Identify the directional movement among the following

i.germination of seed ii.roots growing toward soil

iii.closing of leaves of touch me not plant iv.roots move towards water.

A .i,iv, B.iii,iv C.i,ii,iv D.i,ii,iii,

Answer :(C).i,ii,iv

2. The pattern of response in the roots of plants is
i. Directional and negatively phototropic
ii. Positively phototropic and negatively geotropic
iii. Non-directional and positively geotropic
iv. Growth dependent and positively hydrotropic

(A) i and ii (B) i and iv (C).iii and iv (D) ii and iii
Answer: (B) i and iv

3. In a synapse chemical signal is transmitted from _____.
A) from dendrite of one neuron to axonal end of other neuron
B) axon to cell body of same neuron
C) cell body to axonal end of same neuron
D) axonal end of one neuron to dendrite of another neuron
ANSWER:(D)

4.Cytokinin promotes
A.elongation of internodes B.Formation of branches
C.Cell Division D.Flowering
Answer: (C) Cell Division

5.The growth of pollen towards ovules is the example of
A.Hydrotropism B.Geotropism
C.Chemotropism D.Phototropism
Answer:(C) Chemotropism

6.Which among the following is male hormone
A.Estrogen B.Testosterone C.adrenaline D.progesterone
Answer:(B) Testosterone

7.The endocrine gland nearest to the heart is
A.Thyroid B.testis C.Pancrease D.Thymus
Answer: (D) Thymus

8.Which of the following is a plant hormones?
A.Insulin B.Thyroxin C.Oestrogen D.Cytokinin
Answer: (D) Cytokinin

9.The gap between two neuron is called a

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A.Dendrite B.Synapse C.Axon D.Impulse
Answer:(B) synapse

10.The brain is responsible for
A.Thinking B.Regulating the heart beat C.Balancing the body D.All of the above
Answer : (D) All of the above

11.The organ that receives stimulus from surrounding is called
A.Receptors B.Effectors
C.Conductors D.Axon
Answer :(A)receptors

12 In higher order animals control and co-ordination is achieved by
A limbs B.Nervous system
C.Endocrine system D.Both b and c
Answer (D) both B and C

13 The central nervous system in human beings consist of
A. brain and nerves B.Brain and spinal cord
C.spinal cord and nerves D.Brain, spinal cord and nerves
Answer :(B)

14. Which is not a reflex action
A. Swallowing of food B.shivering in cold
C.Salivation at the site of food D.closure of eyes to a flashlight
Answer: A

15. The hormone that triggers the fall of mature leaves and fruits from plant is
A) Auxin B) Abscissic acid
C) Cytokinin D) Gibberellin
Answer:B

16.The hormone that determines the fight or flight response in our body is
A) Thyroxin B) Adrenalin
C) Insulin D) Growth hormone
Answer:B

17.The shape of the guard cell changes due to change in the
A)Protein composition of cell B)Temperature of cell
C) Amount of water in cell D) position of nucleus in cell

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Answer:C

18.In reflex action ,reflex arc is formed by

A) Brain –Spinal cord—Muscles
B) Receptor—spinalcord--- effectors
C) Muscle—receptor brain
D) Effector –spinal cord –effector

Answer:B

19.Which pair among the following is mis matched

A) Cerebrum-Memory
B) Medulla—Temperature regulation
C) Posture and equilibrium
D) olfactory lobes—receives and interpret smell

Answer:B

20) Dwarfism is the result of

A) Excessive secretion of thyroxin
B) Undersecretion of growth hormone
C) under secretion of adrenaline
D) Excessive secretion of growth hormone

Answer:B. under secretion of growth hormone

One mark questions

1.Name the largest cell present in human body.

Answer :Neuron

2.What is the function of thyroxine?

Answer:Thyroxine regulates carbohydrates,protein and fat metabolism.

3. Mention the part of the brain which controls the involuntary actions like blood pressure, salivation etc

Answer:Medulla in hind brain

4.Name two tissues which provide control and co-ordination in animals.

Answer:Nervous tissue and muscular tissue

5.What is synapse?

Answer:A gap between neuron is called synapse.

6.What is reflex action?

Answer:Sudden and automatic response to stimuli.

7.Which is the center of reflex action?

Answer:Spinal cord

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8.What is reflex arc?

Answer:Reflex arc is the pathway of nerve involved in reflex action.

9. Which part of the brain maintains posture and equilibrium of the body?

Answer: Cerebellum

10.Why is the use of iodized salt advisable ?

Answer: Iodine is important for producing thyroxin.

11. What are plant hormones?

Answer: *Plant hormones* are chemical compounds present in plants.

12. Why hormones are called chemical messengers?

Answer: Hormones are called chemical messengers because they are chemical agents that signals particular cells to show specific action.

13. What are sensory neurons?

Answer: sensory neuron is cells that carry information from the body parts (senses)

14. What are Motor neurons?

Answer: Motor neuron are cells that transmit impulses from the spinal cord to skeletal and smooth muscles

15.Why are some patients of diabetes treated by giving injection of insulin?

Answer:To control the blood glucose level.

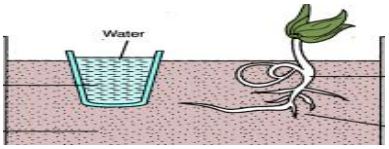
16.Give example for growth inhibiting phytoharmone .

Abscissic acid

17.How do we detect the smell of an agarbatti (incense stick)?

Answer:Smell of an agarbatti is detected by olfactory receptors present in the nose.

18.Name the type of movement shown in the following figure.



Answer: Hydrotropism

19.Name a hormone produced by pituitary gland and mention it's functions .

Growth hormone—stimulates growth in all organs.

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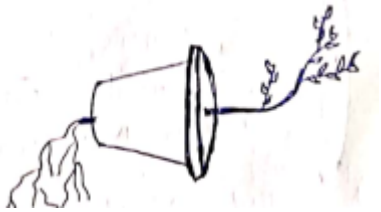
20.Identify the type of movement shown in the given figure.

B



A

Answer:A- geotropism
B-phototropism

Two mark questions

1.Differentiate between reflex action and walking.

Answer:Reflex action are the involuntary actions that occur in response to stimuli.
Walking is voluntary action controlled by cerebellum.

2.What happens at the synapse between two neurons ?

Answer:Between the synapse between two neurons electric signals are converted into chemicals that can easily cross over the gap and pass on the chemical messenger to next neuron where it is converted back to electrical signal.

3.What is the role of the brain in reflex action ?

Answer:Reflex action are generated in spinal cord and the information also reaches brain. This helps the brain to record this event and remember it for future use. Brain helps the person the person to get awareness of the stimulus and prevent himself from that situation again.

4.Give two example of a plant hormone that promotes growth

Answer:Auxins and Gibberlins are the hormone responsible for the growth of plant.

Auxins are responsible for the cell elongation in shoot and also regulates growth.

Gibberlin is responsible for stem elongation and germination

Three marks questions

1. What is the function of receptors in our body?Think of situations where receptors do not work properly.what problems are likely to arise?

Answer: Receptors are present in all parts of our body like skin, eye nose etc,they detect the signal and send them through sensory nerves to the brain in the form of electrical signal. Ifthese receptors are damaged then they will not be able to detect the input and the body will not respond to situation. this may harm the body in danger situations.

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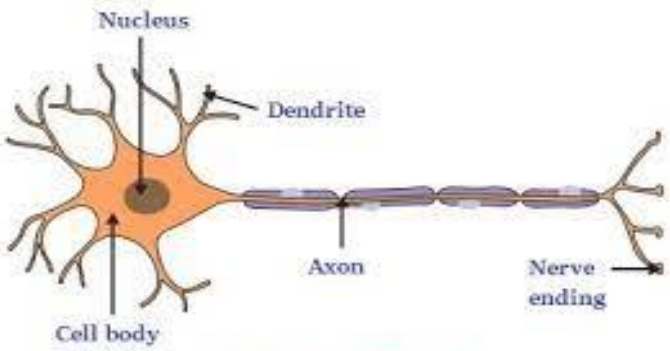
2.Draw diagram of neuron and label the following

a.Part where information is received

b.part through which information travels as electric signal



Structure of Neuron

3.How do auxins promote the growth of a tendril around a support?

Answer:Auxins are the plant hormones produces at the tip of a shoot and root. Auxins are present at the tip of tendrils. When tendrils are attached around any support their growth is slowed down as auxins are sensitive to touch. This make them move to the other side of the tip to get support this makes the other side grow faster than the side of tendril in contact with the support and the tendril bends towards the support.

4.How does chemical coordination occur in plants?

Answer:Plant growth, development and responses to the environment is controlled and coordinated by a special class of chemical substances known as hormones. Hormones are produced in one part of the plant and are transported to all the needy parts of the plant. The five major types of phytohormone are auxins, gibberellins, cytokinins, abscisic acid, and ethylene. These phytohormones are either growth promoters (such as auxins, gibberellins, cytokinins, and ethylene) or growth inhibitors such as abscisic acid.

5. How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?

Answer:

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Sl. no	Movement of leaves of the sensitive plant	Movement of a shoot towards light
1	It does not depend on the direction of stimulus applied.	Depends on the direction of stimulus applied.
2	Called as Nastic movement	Called as tropic movement
3	Touch is the stimulus	Light is the stimulus
4	Caused by the sudden loss of water from the swellings at the base of leaves	Caused by the unequal growth on the two sides of the shoot.
5	Not a growth movement	Growth movement
6	Occurs very fast	Occurs slowly

6. How are involuntary actions and reflex actions different from each other?

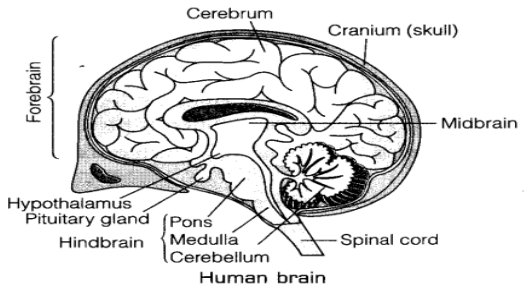
Reflex actions	Involuntary actions
1. Rapid automatic responses to a stimulus without the conscious involvement of the brain	1. Occurs without the consciousness of an organism
2. Controlled by spinal cord	2. Controlled by mid brain or medulla oblongata
3. Very quick and instantaneous	3. Relatively slower
4. May involve any muscle or a gland	4. Involves only smooth muscles
5. Can be conditioned	5. Cannot be influenced by external conditioning
Examples: Blinking of eyes, salivation	Examples: Beating of heart, blood circulation

Four mark questions

1.Draw the diagram of human brain and label the following parts

a.part that maintains body posture

b.part that controls involuntary actions



Human brain

2.Write the functions of, a) Forebrain b)Cerebellum c) Mid brain d)Medulla

Answer: a) Forebrain: - 1.Control the voluntary actions.

2. Stores information collected from sense organs (Memory)

3.Receives sensory impulses from various body parts and integrates it.

4.Sensation of hunger.

b)Cerebellum: -1.Controls posture and balance 2.Control precision of voluntary actions

c) Mid brain : Controls involuntary activities.

d)Medulla : Controls involuntary actions eg. blood pressure, salivation, vomiting

3.Name different type of trophisms exhibited by the plants and write their meaning.

Answer: A tropism is a growth toward or away from a stimulus.

Phototropism - the directional growth of an organism in response to light (controlled by auxin)

Thigmotropism - plant growth in response to touch or contact with a solid object.

Geotropism - growth in response to gravity.

Hydrotropism - directional growth in response to water.

Chemotropism - growth in response to chemicals.

4.List the important plant hormones and write their functions.

Answer:

Plant hormones	Functions
a.Auxin	helps the cells to grow longer
b.Gibberellin	help in the growth of the stem
c.Cytokinins	promote cell division
d.Abscisic acid	Inhibits growth. (Ex-wilting of leaves)

5.What is a gland?Name the two types of gland.List the endocrine glands present in human and write its function.

Answer:A gland is an organ which produces and releases substance that perform specific function in the body.

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There are two types of glands:exocrine (duct glands), endocrine (duct-less gland)

Gland	Hormone	Function
Pituitary Gland	Growth hormone	Controls growth- (dwarfism & gigantism.)
Thyroid Gland	Thyroxin	regulates carbohydrate, protein and fat metabolism(Goitre)
Adrenal Gland	Adrenaline	Increase heart beat, blood pressure, breathing rate, to face the situation.
Pancreas	Insulin	regulates the blood sugar level.(Diabetes)
Testis	Testosterone	changes associated with puberty in males
Ovary	Oestrogen	changes associated with puberty in females

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DIRECTORATE

7. HOW DO ORGANISMS REPRODUCE

Multiple choice questions

1. The two oviducts in a human female unite into an elastic bag like is known as
a. Vagina **b. Uterus**
c. Fallopian tube d. Cervix

2. Which of the following disease is transmitted sexually?
a. Kala azar b. Jaundice
c. Cholera **d. Syphilis**

3. Which of the following is a contraceptive?
a. Copper t b. Condom
c. tubectomy **d. All of these**

4. When a animal is cut into pieces and each piece grows into a complex organism. What is the process?
a. Budding b. Fragmentation
c. Spore formation **d. Regeneration**

5. Which is the portion on which grafting is done it provides the roots?
a. Stock b. Scion
c. Both a and b d. None of these

6. Where does fertilization occur in human females?
a. Uterus b. Cervix
c. Oviduct d. None of these

7. Growing foetus derive nutrition from mother's blood through
a. Uterus b. Fallopian tube
c. placenta d. cervix

8. What is the puberty age in human males?
a. 8-10 b. 10-12
c. 12-14 d. 14-16

9. Fruits are formed from
a. Stamen b. Stigma
c. Ovary d. Ovule

10. IUCD is for
a. Vegetative propagation **b. Contraception**
c. Increasing fertility d. Avoiding miscarriage

11. Asexual reproduction takes place through budding in
(a) amoeba. (b) yeast.
(c) plasmodium. (d) leishmania.
► (b) yeast.

12. Which of the following is not a part of the female reproductive system in human beings?
(a) Ovary (b) Uterus
(c) Vas deferens (d) Fallopian tube
► (c) Vas deferens

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13. The anther contains

(a) sepals. (b) ovules.
(c) carpel. (d) pollen grains.

► (d) pollen grains.

TWO MARKS QUESTIONS

14. How does binary fission differ from multiple fission?

Answer: In binary fission a single cell divides into two equal halves. Amoeba and Bacteria divide by binary fission.
In multiple fission, a single cell divides into many daughter cells simultaneously. Plasmodium divide by multiple fission.

15. How will an organism be benefited if it reproduces through spores?

Answer: Advantages of spore formation:
→ Large numbers of spores are produced in one sporangium.
→ Spores are distributed easily by air to far-off places to avoid competition at one place.

→ Spores are covered by thick walls to prevent dehydration under unfavourable conditions.

16. What is the role of the seminal vesicles and the prostate gland?

Answer

- The secretions from seminal vesicles and prostate glands lubricate the sperms and provide a fluid medium for easy transport of sperms.
- Their secretion also provides nutrient in the form of fructose, calcium, and some enzymes.

17.If a woman is using a copper-T, will it help in protecting her from sexually transmitted diseases?

Answer

- No, because copper-T will not prevent contact body fluids. Thus it will not protect her from sexually transmitted diseases

- 1. What is sexual reproduction?
- ➢ It is a type of reproduction which involves the fusion of male and female gametes produced by two parents' male and female.

18. What are the advantages of sexual reproduction?

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➢ Sexual reproduction creates variations which are useful for ensuring survival of species and species formation.

19 . Why is reproduction necessary even though it is not a life process?

➢ Even though it is not a life process like nutrition, respiration and excretion. It is necessary to continue their progeny.

19. What is puberty?

➢ As the rate of General body growth begins to slow down reproductive tissue begin to mature. This period during adolescence is called puberty.

20. How does the embryo get nutrition?

➢ The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta.

21. List the parts of male reproductive system in human beings.

➢ Male reproductive system consists of testis which produce sperms, vas difference, seminal vesicle, prostate glands, urethra and penis.

22. List the parts of female reproductive system in human beings.

➢ The female reproductive system in human beings consists of ovaries Fallopian, tubes, uterus and vagina.

23. What is the role of seminal vesicle and prostate glands?

➢ Seminal vesicles and prostate glands secrete fluids which help in the transportation of sperms easier and this fluid provides nutrition.

24. Where are sperms produced? What is the structure of sperm?

➢ Sperms are produced in testis.

➢ The sperms are tiny bodies that consists of mainly genetic material and a long tail that helps them to move towards the female germ cell

25. Why are scrotum located outside the abdominal cavity?

➢ Sperms are produced in scrotum which are located outside the abdominal cavity because sperm formation requires a lower temperature than the normal body temperature.

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26. How is embryo formed?

➢ Sperms fertilize the egg to form zygote.

➢ zygote implants in the lining of the uterus and starts dividing.

➢ This forms of mass of cells called embryo, which develops the body parts later. 12. How does the embryo get nourishment inside the mother's body?

➢ The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta

➢ Placenta is a disk like tissue which develops between the uterus uterine wall and embryo.

➢ It has villi on embryo side of the tissue it has blood space on the mother's side which surround the Villi.

➢ This provides a large surface area for glucose and oxygen to pass from the mother to the Embryo.

➢ Embryo generates waste substances, which are removed by transferring them into mother's blood through placenta.

27. What happens when the egg is not fertilized?

➢ Ovaries release one egg every month.

➢ The uterus prepares itself every month to receive fertilized egg.

➢ It's lining becomes thick and spongy to nourish the embryo if fertilized.

➢ This lining is not needed any longer if the egg is not fertilized.

➢ So the lightning slowly breaks and comes out through the vagina as blood and mucus, which is known as menstruation.

➢ This Cycle takes place roughly every month. It lasts for about 2 to 8 days.

28. What are the changes seen in girls at the time of puberty?

➢ The changes seen in girls at the time of puberty are as follows.

➢ Growth of hair in armpits and pubic region

➢ Breast size begins to increase with darkening of skin of the nipples at the tip of the breasts.

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➢ Girls begin to menstruate at around this time.

29. What are the changes seen in boys at the time of puberty?

➢ Changes seen in boys at the time of puberty are

➢ New thick hair growth on the face.

➢ Their voice begin to crack

➢ Penis occasionally begins to become enlarged and erect either in day dream or at night.

30. a) What is pollination?

b) Mentioned the types of pollination?

c) What are the agents required for cross pollination?

➢ a) Transfer of pollen grains from anther to stigma is known as pollination.

➢ b) There are two types of Polynesians. They are Self pollination and Cross pollination

➢ c)The agents required for cross-pollination are wind, water, insects, birds and animals.

31. a)What is germination? b)What is the function of plumule and radical?

➢ The seed contains the future plant or embryo which develops into a seedling under appropriate conditions. This process is known as germination.

➢ The plume will develop into future shoot and the radical develops into future root.

32. What are sexually transmitted diseases STDs? Give you examples.

➢ The diseases which are transmitted from one person to another through sexual act are called STD

➢ Examples are Bacterial diseases-gonorrhea.syphilis.

➢ Viral diseases warts,HIV/AIDS

33. a)Name the different contraceptive methods.

b)What is the side effect of using oral pills?

c) What is the side effect of using copper-T?

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(a) ➢ There are many ways have been devised to avoid pregnancy.

➢ Barrier method -use of condoms

➢ Chemical methods- oral pills and vaginal pills

➢ Surgical methods vasectomy and tubectomy

b)Hormonal imbalance

c)Causes irritation of the uterus

34. Why is DNA copying an essential part of the reproduction?

➢ Chromosomes in the nucleus of the cell contain information for inheritance of features from parent to Next Generation in the form of DNA.

➢ The DNA in the cell nucleus is the information source of making proteins. Therefore a basic event in reproduction is create another DNA copy for the Next Generation

35. In a hibiscus flower anthers are removed and Pistil is left as it is. Does pollination take place in that flower? How?

➢ Yes pollination takes place. Hibiscus is a bisexual flower. If only anthers are removed Self-pollination will not take place. But cross-pollination can take place with the help of Agents like insects, birds, wind, water or animals.

➢ Diagrams : Longitudinal section of a flower and Germination of Pollen on stigma

THREE MARKS QUESTIONS

36. What is the importance of DNA copying in reproduction?

Answer

- DNA is the genetic material present in the cells of all organisms.
- The genetic information from generation to generation is carried by DNA .
- It is therefore possible for the organism to produce organism of its own type due to DNA copying only.
- For the inheritance of traits of the parent,DNA copying is a must.DNA copying also brings about variation ,which forms the basis for the origin of new species.

37. Why is variation beneficial to the species but not necessarily for the individual?

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Answer

- Variations are beneficial to the species than individual because sometimes for a species, the environmental conditions change so drastically that their survival becomes difficult. For example, if the temperature of water increases suddenly, then most of the bacteria living in that water would die.
- Only few variants that are resistant to heat would be able to survive.
- However, if these variants were not there, then the entire species of bacteria would have been destroyed. Thus, these variants help in the survival of the species.
- However, all variations are not necessarily beneficial for the individual organisms.

38.. How does binary fission differ from multiple fission?

Answer

In binary fission a single cell divides into two equal halves.Amoeba and Bacteria divide by binary fission. In multiple fission, a single cell divides into many daughter cells simultaneously. Plasmodium divide by multiple fission.

39. How will an organism be benefited if it reproduces through spores?

Answer

Advantages of spore formation:
→ Large numbers of spores are produced in one sporangium.
→ Spores are distributed easily by air to far-off places to avoid competition at one place.

→ Spores are covered by thick walls to prevent dehydration under unfavourable conditions.

40. Can you think of reasons why more complex organisms cannot give rise to new individuals through regeneration?

Answer

- Higher complex organisms cannot give rise to new individuals through regeneration because complex organisms have organ-system level of organization.
- All the organ systems of their body work together as an interconnected unit.
- They can regenerate their lost body parts such as skin, muscles, blood, etc. However, they cannot give rise to new individuals through regeneration.

41. Why is vegetative propagation practised for growing some types of plants?

Answer

Vegetative propagation is practiced for growing some types of plants because of following advantages:

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→ It is used to grow a plant in which viable seeds are not formed or very few seeds are produced such as Orange, Banana, Pineapple.

→ It helps to introduce plants in new areas where the seed germination fails to produce mature plant due to change in environmental factors and the soil.→ It is more rapid, easier and cheaper method.
→ By this method a good quality of a race or variety can be preserved.

42. Why is DNA copying an essential part of the process of reproduction?

Answer

- DNA copying is an essential part of reproduction as it passes genetic information from parents to offspring.
- It determines the body design of an individual. The reproducing cells produce a copy of their DNA through some chemical reactions and result in two copies of DNA.
- The copying of DNA always takes place along with the creation of additional cellular structure. This process is then followed by division of a cell to form two cells.

43. How is the process of pollination different from fertilization?

Answer

Pollination is the process of transfer of pollens from anther to stigma. It occurs with the help of certain pollinators such as air, water, birds, or some insects.
Fertilization, is the fusion of the male and female gametes. It occurs inside the ovule and leads to the formation of zygote.

44. What are the changes seen in girls at the time of puberty?

Answer

The changes seen in girls at the time of puberty are:
→ Increase in breast size and darkening of skin of the nipples present at the tips of the breasts.
→ Appearance of hair in the genital area.
→ Appearance of hair in other areas of skin like underarms, face, hands, and legs.
→ Increase in the size of uterus and ovary.
→ Beginning of menstrual cycle.
→ More secretion of oil from the skin, which results in the appearance of pimples.

45. How does the embryo get nourishment inside the mother's body?

Answer

- After fertilization the lining of uterus thickens and is richly supplied with blood to nourish the growing embryo.
- The embryo gets nutrition from the mother’s blood with he help of a special tissue called placenta.

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- It is embedded in the uterine wall. Placenta contains Villi on the embryo's side of the tissue and blood spaces on mother's side surrounding the villi.
- This provides a large surface from mother to the embryo and waste products from embryo to mother.

46. If a woman is using a copper-T, will it help in protecting her from sexually transmitted diseases?

Answer

No, because copper-T will not prevent contact body fluids. Thus it will not protect her from sexually transmitted diseases.

47. What are the advantages of sexual reproduction over asexual reproduction?

Answer

Advantages of sexual reproduction:
→ In sexual reproduction, more variations are produced. Thus, it ensures survival of species in a population.
→ The new formed individual has characteristics of both the parents.
→ Variations are more viable in sexual mode than in asexual one. This is because in asexual reproduction, DNA has to function inside the inherited cellular apparatus.

48. What are the functions performed by the testis in human beings?

Answer

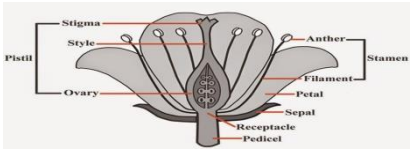
Functions of testes:
→ Produce sperms, which contain haploid set of chromosomes of father.
→ Produce a hormone called testosterone, which brings about secondary sexual characters in boys.

49. Why does menstruation occur?

Answer

- Menstruation is a process in which blood and mucous flows out every month through the vagina.
- This process occurs every month because one egg is released from the ovary every month and at the same time, the uterus (womb) prepares itself to receive the fertilized egg.
- Thus, the inner lining of the uterus gets thickened and is supplied with blood to nourish the embryo.
- If the egg does not get fertilised, then the lining of the uterus breaks down slowly and gets released in the form of blood and mucous from the vagina.

50. Draw a labelled diagram of the longitudinal section of a flower.



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51. What are the different methods of contraception?

The contraceptive methods can be broadly divided into the following types:
→ **Natural method:** It involves avoiding the chances of meeting of sperms and ovum. In this method, the sexual act is avoided from day 10th to 17th of the menstrual cycle because during this period, ovulation is expected and therefore, the chances of fertilization are very high.

→ **Barrier method:** In this method, the fertilization of ovum and sperm is prevented with the help of barriers. Barriers are available for both males and females. Condoms are barriers made of thin rubber that are used to cover penis in males and vagina in females.
→ **Oral contraceptives**: In this method, tablets or drugs are taken orally. These contain small doses of hormones that prevent the release of eggs and thus fertilization cannot occur.
→ **Implants and surgical methods**: Contraceptive devices such as the loop or Copper-T are placed in uterus to prevent pregnancy. Some surgical methods can also be used to block the gamete transfer. It includes the blocking of vas deferens to prevent the transfer of sperms known as **vasectomy**. Similarly, fallopian tubes of the female can be blocked so that the egg will not reach the uterus known as **tubectomy**.

52. How are the modes for reproduction different in unicellular and multicellular organisms?

Answer

- In unicellular organisms, reproduction occurs by the division of the entire cell. The modes of reproduction in unicellular organisms can be fission, budding, etc.
- whereas in multicellular organisms, specialised reproductive organs are present. Therefore, they can reproduce by complex reproductive methods such as vegetative propagation, spore formation, etc. In more complex multicellular organisms such as human beings and plants, the mode of reproduction is sexual reproduction.

53. How does reproduction help in providing stability to populations of species?

Answer

- Reproduction is the process of producing new individuals of the same species by existing organisms of a species.
- it helps in providing stability to population of species by giving birth to new individuals as the rate of birth must be at par with the rate of death to provide stability to population of a species.

54. What could be the reasons for adopting contraceptive methods?

Answer

Contraceptive methods are mainly adopted because of the following reasons:
→ To prevent unwanted pregnancies.
→ To control population rise or birth rate.
→ To prevent the transfer of sexually transmitted diseases.

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55.The type of reproduction found in spirogyra is(sep 2020)

(a) Budding (b) Fragmentation (c) Vegetative reproduction (d) Spore formation

Answer:(b) Fragmentation

56.How does menstruation occurs?(sep 2020)

Answer:

- The uterus prepares itself every month to receive a fertilized egg and thus its lining becomes thick and spongy.
- If the egg is not fertilized , the lining slowly breaks and comes out through the vagina as blood and mucous.

57. How does the process of budding in hydra is different from Bryophyllum?(sep 2020)

Answer:

- In Hydra , a bud develops as an outgrowth due to repeated cell division at one specific site. These buds develops into tiny individuals and when fully mature , detach from the parent body and become new independent individuals.
- In Bryophyllum ,buds are produced in the notches along the leaf margin. These buds fall on the soil and dovelop into new plants.

58. (a) Explain the development of fertilized egg into a foetus in a woman .(sep 2020)

(b) In humans , how the surgical contraceptive methods can be used to prevent pregnancy?(sep 2020)

Answer:(a)

- The fertilized eggs starts dividing and forms a ball of cells or embryo.
- The embryo is implanted in the lining of the uterus where they continue to grow and dovelop organs to become foetus

(b)

- If the vas deferens in the main is blocked , sperm transfer will be prevented, Fertilization will not take place.
- If the fallopian tube in the woman is blocked,the egg will not be able to reach the uterus. Frtilization will not take place

59.Draw the Diagram showing the germination of pollen on stigma and label the pollen tube.(April 2020)

Answer:

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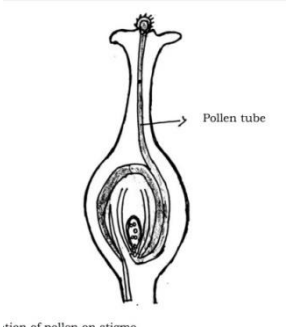

60. Explain the significant function of each structure in human male reproductive system.(April 2020)

Answer:

- **Testis:** They produce sperms and testosterone hormone which is responsible for male characters.
- **Scrotum:** They regulate temperature necessary for production of sperms .
- **Urethra and vas deferens:** Transport sperm from testis.
- **Prostate gland and seminal vesicle:**They add their secretion to make the sperm transport easier and provide nutrition.
- **Panis:** Delivers the sperms to the site of fertilization.

61. Explain the structure and important role of placenta during gestation period of woman.(April 2020)

Answer:

- During pregnancy period the embryo gets nutrition from the mother's blood with help of disc shaped special tissue embedded in the uterine wall is called placenta.
- It contains villi on the developing side of the tissue.
- Villi provide glucose and oxygen to pass from mother to embryo.
- Removes the wastes generated from the embryo.

62. The group of organisms that reproduce through fission only is.(jun 2019)

(a) Amoeba , Hydra, Spirogyra *(b) Leishmania, amoeba, yeast*

(c) Amoeba, Plasmodium, Planaria *(d) Plasmodium, Amoeba, Leishmania*

Answer:(d) Plasmodium, Amoeba, Leishmania

64. Part of the flower that develops into fruit and part of the seed that develops into root respectively are(April 2019)

(a)ovary and plumule (b) plumule and radicle

(c) ovary and radicle (d) ovary and ovule

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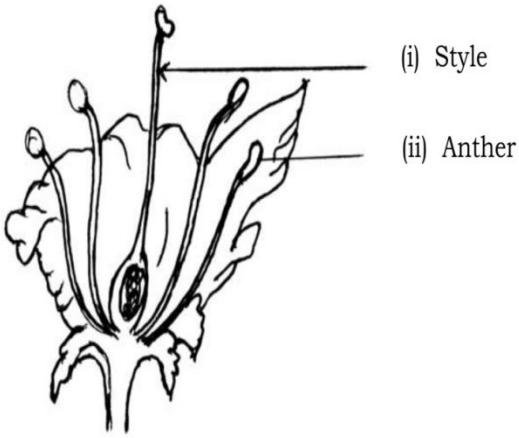
Answer:(c) ovary and radicle

65. Draw the diagram showing the longitudinal section of a flower, label the following parts

(i) style (ii) Anther (April 2019)

Answer:



66.. Name the types of asexual reproduction that occurs in the following.

(i) Pomogranate (ii) Hydra (iii)Planaria (iv) Plasmodium (April 2019)

Answer:(i) Pomogranate ------Vegetative reproduction

(ii) Hydra -------Budding

(iii) Planaria -------- Regeneration

(iv) Plasmodium -------- Multiple fission

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8. HEREDITY AND EVOLUTION

Multiple choices questions

1.If a trait A exists in 10% of population of an asexually reproducing species and a trait B exists in 60% of the same population. Which trait is likely to have arisen earlier?

a) Trait A b) Trait c)Both A & B d)none

Ans: B trait B

2.An example of homologous organs is

a)Our arm and dog's fore leg b)our teeth and elephant's tusks

c)Potato and runners of grass d) All of the above

Ans:A) our arm and dog's fore leg

3.In evolutionary terms, we have more in common with

a) a Chinese school boy b) a chimpanzee c) a spider d)a bacterium

Ans: b) chimpanzee

4. An example of analyses organs is

a) A wing of a bat & wing of a bird b) Potato and turners of grass

c)our teeth & elephant's tusk d) None of the above

Ans:a.A wing of a bat & wing of a bird

5.The process where characteristics are transmitted from parent to offspring's is called

a)Variation b)Heredity c)Gene d)None of the above

Ans:B Heredity

6.The phenomenon where individuals of a spaces exhibit differences in characteristics is called

a)adaptation b)Evolution c)Variation d) All of the above

Ans: c) Variation

7.Which of the following statement is incorrect?

a) Gene is a sequence of nucleotides

b)During the process of gene expression DNA is first copied to RNA

c)Gene cannot acquire mutations in their sequence

d)None of the above

Ans:c) Genes cannot acquire mutations in their sequence

8._____ is the desirable set of characteristics of an organism.

a)phenotype b)genes c) DNA d)All of the above

Ans: a Phenotype

9.When a new plants is formed as a result of cross pollination from different varieties of a plant the newly formed plant is called

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a) Dominant plant b)Mutant plant c) Hybrid plant d) all of the above

Ans:c Hybrid plant

10.Who proposed the theory of evolution?

a) Charles Darwin b)Stanely miller c) Aristotle d)Hard Urey.

Ans: (a) Charles Darwin

11.Homologous organs are organs that have

a)Different function with different structure b)same function with same structure

c)same function with different structure d)Different function but same structure

Ans: d)Different function but same structure

12.Which part of the DNA provides information for a protein?

a)Chromosome b)Mitochondria c)RNA d) Gene

Ans: d) Gene

13.Which of the following is not controlled by gene?

a) Eye colour b) Height c) Hair colour d) None of the above

Ans: d) None of the above

14.Which of the following can be inherited from parents to off springs.

a)Swimming technique b)Sculpted body c) Big nose d)None of the above

Ans:c) Big nose

15.Which of the following scientist gave the principles ofinheritance?

(a) Mendel (b) Griffin (c) Johansson (d) Watson andCrick

► **(a)Mendel**

16.Which one of the following pairs are homologousorgans?

(a) Forelimbs of a bird and wings of abat.

(b) Wings of a bird and wings of abutterfly.

(c) Pectoral fins of a fish and forelimbs of ahorse.

(d) Wings of a bat and wings of acockroach.

► **(a) Forelimbs of a bird and wings of abat.**

17.Select the group which shares maximum number of commoncharacters-

(a) two genera of twofamilies

(b) two species of agenus

(c) two genera of afamily

(d) two individuals of aspecies

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►(d) two individuals of a species

18.A cross between a tall pea-plant (TT) and a short pea-plant (tt) resulted in progenies that were all tall plants because

(a) Tallness is the recessive trait.

(b) Shortness is the dominant trait.

(c) Height of pea-plant is not governed by gene T or t.

(d) Tallness is the dominant trait.

► **(d) Tallness is the dominant trait**

19.Process of selecting individuals with desired characters by man is called

(a) Hybridization

(b) Reproduction

(c) Artificialselection

(d) Naturalselection

► **(c) Artificialselection**

20.What does the progeny of a tall plant with round seeds and a short plant with wrinkled seeds look like?

(a) All are tall with roundseeds.

(b) All are short with roundseeds.

(c) All are tall with wrinkledseeds.

(d) All are short with wrinkledseeds.

► **(a) All are tall with roundseeds.**

20.Some dinosaurs had feathers although they could not fly but birds have feathersthat help them to fly. In the context of evolution this means that-

(a) reptiles have evolved frombirds

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(b) there is no evolutionary connection between reptiles andbirds

(c) feathers are homologous structure in both theorganisms

(d) Birds have evolved from reptiles.

► **(d) Birds have evolved fromreptiles.**

21.A zygote which has an X-chromosome inherited from the father will develop into a

(a) girl

(b) boy

(c) either boy orgirl

(d) X-chromosome does not influence the sex of a child.

► **(a)girl**

22.The process of evolution of a species whereby characteristics which help individual organisms to survive and reproduce are passed on to their offspring and those characteristics which do not help are not passed on iscalled.

(a) Artificialselection

(b) Speciation

(c) Hybridization

(d) Naturalselection

► **(d) Naturalselection**

23.Which of the following decides the sex of thechild?

(a) male gamete, i.e.,sperm

(b) female gamete, i.e.,ovum

(c) both sperm and ovum

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(d) mother

► **(a) male gamete, i.e.,sperm**

24.Which of the following is the ancestor of'Broccoli'?

(a) Cabbage

(b) Cauliflower

(c) Wild cabbage

(d) Kale

► **(c) Wildcabbage**

25.According to the evolutionary theory formation of a new species occursgenerally due to-

(a) Sudden creation bynature.

(b) accumulation of variations over severalgenerations

(c) clones formed during asexualreproduction

(d) Movement of individuals from one habitat toanother.

► **(b) accumulation of variations over severalgenerations**

26. Which of the following is notcorrect-

(a) For every hormone there is agene.

(b) For every protein there is agene.

(c) For production of every enzyme there is agene.

(d) For every molecule of fat there is agene.

Ans- (d). For every molecule of fat there is agene.

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27. If a round, green seeded pea-plant (RRyy) is crossed with a wrinkled yellow seeded pea- plant (rrYY), the seeds produced in F1 generationare

(a) round andgreen

(b) round andyellow

(c) wrinkled andgreen

(d) wrinkled andyellow

► **(b) round andyellow**

28.The concept of origin of species by natural selection was givenby.

(a) lamarck

(b) weismann

(c) Darwin

(d) Linnaeus

► **(c)Darwin**

29.The genetic constitution of an organism iscalled.

(a) Genotype

(b) phenotype

(c) variation

(d) gene.

► **(a)Genotype**

30.A man with blood group A marries a woman having blood group O. What will bethe blood group of thechild?

(a) Oonly

(b) Aonly

(c) AB

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(d) Equal chance of acquiring blood group A or blood groupO.

► **(d) Equal chance of acquiring blood group A or blood groupO.**

31. Identify the two organisms which are now extinct and are studied from theirfossils.

(a) white tiger andsparrow

(b) dinosaur and fish(Knightia)

(c) ammonite and white tiger

(d) trilobite and whitetiger

► **(b) dinosaur and fish(Knightia)**

32.Those organs which have the same basic structure but different functions arecalled

(a) Vestigialorgans

(b) Analogousorgans

(c) Homologousorgans

(d) None ofthese

► **(c) Homologousorgans**

33.Which of the following characters can be acquired but notinherited?

(a) Colour ofskin

(b) Size ofbody

(c) Colour of eyes

(d) Texture ofhair

► **(b) Size ofbody**

34.Differences between organisms in a species are described as variation. Which ofthe following would you describe as continuousvariation?

(a) Haircolour

(b) Eyecolour

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(c) Weight

(d) Sex

► **(c)Weight**

35. Mendel proposed that every character is controlled by-

(a) one factor

(b) two factors

(c) one chromosome

(d) two chromosomes

► **(b) Twofactors.**

36.Two pink colored flowers on crossing results in 1 red, 2 pink and 1 whiteflower progeny. The nature of the crossis-

(a) crossfertilization

(b) self pollination

(c) doublefertilization

(d) nofertilization

► **(a) crossfertilization**

37.The remaps (or impressions) of dead animals or plant? that lived in the remote past are known as

(a) extinctspecies
(b) fossils

(c) naturally selectedspecies

(d) none of theabove

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► **(b)fossils**

38.A cross between two individuals results in a ratio of 9 : 3 : 3 :1 for fourpossible phenotypes of progeny. This is an example ofa

(a) Monohybrid cross

(b) Dihybrid cross

(c) Test cross

(d) F1 generation

Ans: (b) Dihybrid cros

39.A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers, but almost half of them were short. This suggests that the genetic make-up of the tall parent can be depicted as

(a) TTWW

(b) TTww

(c) TtWW

(d) TtWw

► **(c) TtWW**

One mark questions and answers

1.What is monohybrid cross?

Ans: The cross which occurs between the plants showing two alternate forms of character.

2.What are dominant genes?

Ans:The genes which expresses itself is called dominant gene

3.Define heredity?

Ans:The inheritance of character from parents to off springs is called heredity.

4.What is the percentage possibility a couple of having daughters?

Ans:50 percent

5. What is dihybrid cross?

Ans:It is a cross between two different genes that differ in two observed traits.

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6.Define evolution?

Ans:Evolution is a continuous and gradual pliers that involves changing life forms from simple to complex forms.

7.Define speciation.

Ans: Speciation is the formation of new and distinct species in the course of evolution

8.What are fossils?

Ans: Fossils are the preserved remains of dead organisms from past.

9.If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% of the same population, which trait is likely to have arisen earlier?

Answer: Trait B because in asexual reproduction traits which are present in the previous generation are carried over to next generation with minimal variations. Trait B have higher percentage so it

TWO MARKS QUESTIONS

10.How does the creation of variations in a species promote survival?

Answer

•Variations occur due to sexual reproduction and also due to inaccurate copying of DNA.

•Depending on the nature of variations, different individuals would have different kinds of advantages.

•For example, bacteria variants which can withstand heat have better chances to survive in a heat wave non-variant bacteria having no capacity to tolerate heat wave.

•Thus, variations in a population of a species help in survival of a species.

11.How do Mendel's experiments show that traits may be dominant or recessive?

Answer

- The trait which appears in all the members of F1 generation and also in 75% numbers of F2 generation obtained by self-fertilization of F1 generation is dominant character
- The trait which does not appear in F1 generation but after self-fertilization of F1 generation, reappears in 25% of F2 generation is known as recessive.

12.How do Mendel's experiments show that traits are inherited independently?

Answer:

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- Mendel crossed pure breeding tall plants having round seeds with pure breeding short plants having wrinkled seeds.
- The plants of F1 generation were all tall with round seeds indicating that the traits of tallness and round seeds were dominant.
- Self breeding of F1 yielded plants with characters of 9 tall round seeded, 3 tall wrinkled seeded , 3 short round seeded and one short wrinkled seeded.
- Tall wrinkled seeded and short round seeded plants are new combinations which can develop only when the traits are inherited independently.

13.A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to tell you which of the traits - blood group A or O - is dominant? Why or why not?

Answer: No. This information is not sufficient to determine which of the traits - blood group A or O - is dominant. This is because we do not know about the blood group of all the progeny.

Blood group A can be genotypically AA or AO. Hence, the information is incomplete to draw any such conclusion.

14.How is the sex of the child determined in human beings?

Answer

- In human beings, the females have two X chromosomes and the males have one X and one Y chromosome. Therefore, the females are XX and the males are XY.
- The gametes, as we know, receive half of the chromosomes. The male gametes have 22 autosomes and either X or Y sex chromosome.

- Type of male gametes: 22+X OR 22+ Y.

However, since the females have XX sex chromosomes, their gametes can only have X sex chromosome.

Type of female gamete: 22+X

Thus, the mother provides only X chromosomes. The sex of the baby is determined by the type of male gamete (X or Y) that fuses with the X chromosome of the female.

15.What are the different ways in which individuals with a particular trait may increase in a population?

Answer

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Individuals with a particular trait may increase in a population as a result of the following:

→ Natural selection: When that trait offers some survival advantage.

→ Genetic drift: When some genes governing that trait become common in a population.

→ When that trait gets acquired during the individual's lifetime.

16.Why are traits acquired during the life-time of an individual not inherited?

Answer

This happens because an acquired trait involves change in non-reproductive tissues which cannot be passed on to germ cells or the progeny. Therefore, these traits cannot be inherited.

17.Why are the small numbers of surviving tigers a cause of worry from the point of view of genetics?

Answer: The small number of members in a population of tigers do not allow large number of variation to occur which are essential to survival of the species.

- A deadly disease or calamity may cause death of all the tigers.
- The small number of tiger also indicates that existing tiger variants are not well adopted to the existing environment and may extinct soon.

18.What factors could lead to the rise of a new species?

Answer: Natural selection, genetic drift and acquisition of traits during the life time of an individual can give rise to new species.

19.Will geographical isolation be a major factor in the speciation of a self-pollinating plant species? Why or why not?

Answer

- Geographical isolation can prevent the transfer of pollens among different plants.
- However, since the plants are self-pollinating, which means that the pollens are transferred from the anther of one flower to the stigma of the same flower or of another flower of the same plant, geographical isolation cannot prevent speciation in this case.

20.Will geographical isolation be a major factor in the speciation of an organism that reproduces asexually? Why or why not?

Answer: No,

- because geographical isolation does not affect much in asexually reproducing organisms. Asexually reproducing organisms pass on the parent DNA to offsprings that leaves no chance of speciation.

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- However, geographical isolation works as a major factor in cross pollinated species. As it would result in pollinated species. As it would result in accumulation of variation in the two geographically separated population

21.Give an example of characteristics being used to determine how close two species are in evolutionary terms.

Answer

- Feathers in some ancient reptiles like dinosaurs, as fossils indicate, evolved to provide insulation in cold weather.
- However, they cannot fly with these feathers later on birds adapted the feathers to flight. This means that birds are very closely related to reptiles, since dinosaurs were reptile.

22.Can the wing of a butterfly and the wing of a bat be considered homologous organs? Why or why not?

Answer

- The wing of a butterfly and the wing of a bat are similar in function. They help the butterfly and the bat in flying.
- Since they perform similar function, they are analogous organs and not homologous.

23.What are fossils? What do they tell us about the process of evolution?

Answer

- Fossils are the remains of organisms that once existed on earth.
- They tell us about the development of the structures from simple structured to complex structured organisms.
- They tell us about the phases of evolutions through which they must have undergone in order to sustain themselves in the competitive environment.

24.Why are human beings who look so different from each other in terms of size, colour and looks said to belong to the same species?

- A species is a group of organisms that are capable of interbreeding to produce a fertile offspring.
- Skin colour, looks, and size are all variety of features present in human beings. These features are genetic but also environmentally controlled.
- Various human races are formed based on these features. All human races have more than enough similarities to be classified as same species.
- Therefore, all human beings are a single species as humans of different colour, size, and looks are capable of reproduction and can produce a fertile offspring.

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25.In evolutionary terms, can we say which among bacteria, spiders, fish and chimpanzees have a 'better' body design? Why or why not?

- Evolution cannot always be equated with progress or better body designs.
- Evolution simply creates more complex body designs. However, this does not mean that the simple body designs are inefficient.
- In fact, bacteria having a simple body design are still the most cosmopolitan organisms found on earth.
- They can survive hot springs, deep sea, and even freezing environment. Therefore, bacteria, spiders, fish, and chimpanzees are all different branches of evolution.

26. A study found that children with light-coloured eyes are likely to have parents with light-coloured eyes. On this basis, can we say anything about whether the light eye colour trait is dominant or recessive? Why or why not?

Answer

This information is not sufficient. For considering a trait as dominant or recessive, we need data of at least three generations. This data is about only two generations

THREE MARKS QUESTIONS

27.How are the areas of study - evolution and classification - interlinked?

Answer

- Classification involves grouping of organism into a formal system based on similarities in internal and external structure or evolutionary history
- Two species are more closely related if they have more characteristics in common. And if two species are more closely related, then it means they have a more recent ancestor.
- For example, in a family, a brother and sister are closely related and they have a recent common ancestor i.e., their parents.
- A brother and his cousin are also related but less than the sister and her brother. This is because the brother and his cousin have a common ancestor i.e., their grandparents in the second generation whereas the parents were from the first generation.
- With subsequent generations, the variations make organisms more different than their ancestors.
- This discussion clearly proves that we classify organisms according to their resemblance which is similar to creating an evolutionary tree.

28.Explain the terms analogous and homologous organs with examples.

Answer

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Homologus organs: are those organs which have the same basic structural design and origin but have different functions.

For Example: The forelimbs of humans and the wings of birds look different externally but their skeletal structure is similar.

Analogus organs :are those organs which have the different basic structural design and origin but have similar functions.

For Example: The wings of birds and insects.

29.Outline a project which aims to find the dominant coat colour in dogs.

Answer

•Dogs have a variety of genes that govern coat colour. There are at least eleven identified gene series (A, B, C, D, E, F, G, M, P, S, T) that influence coat colour in dog.

•A dog inherits one gene from each of its parents. The dominant gene gets expressed in the phenotype. For example, in the B series, a dog can be genetically black or brown.

•Let us assume that one parent is homozygous black (BB), while the other parent is homozygous brown (bb)

cross	B	B
b	Bb	Bb
b	Bb	Bb

- In this case, all the offspring's will be heterozygous (Bb).
- Since black (B) is dominant, all the offspring's will be black. However, they will have both B and b alleles.
- If such heterozygous pups are crossed, they will produce 25% homozygous black (BB), 50% heterozygous black (Bb), and 25% homozygous brown (bb) offsprings

30.Explain the importance of fossils in deciding evolutionary relationships.

Answer

Fossil provide us evidence about

→ The organisms that lived long ago such as the time period during which they lived, their structure etc.

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→ Evolutionary development of species i.e., line of their development.

→ Connecting links between two groups. For example, feathers present in some dinosaurs means that birds are very closely related to reptiles.

→ Which organisms evolved earlier and which later.

→ Development of complex body designs from the simple body designs.

31.How is the equal genetic contribution of male and female parents ensured in the progeny?

Answer

- In human beings, equal genetic contribution of male and female parents is ensured in the progeny through inheritance of equal number of chromosomes from both parents.
- There are 23 pairs of chromosomes All human chromosomes are not paired. Out of these 23 pairs, the first 22 pairs are known as autosomes and the remaining one pair is known as sex chromosomes represented as X and Y.
- Females have a perfect pair of two X sex chromosomes and males have a mismatched pair of one X and one Y sex chromosome.
- During the course of reproduction, as fertilization process takes place, the male gamete (haploid) fuses with the female gamete(haploid) resulting in formation of the diploid zygote.
- The zygote in the progeny receive an equal contribution of genetic material from the parents. Out of 23 pairs of chromosomes in progeny, male parent contributes 22 autosomes and one X or Y chromosome and female parent contributes 22 autosomes and one X chromosome.

32.How is the sex of the child determined in human beings?

Answer :

Females have 22 + two X chromosomes and the males have 22+ one X

and one Y chromosome. Therefore, the females are22+ XX and the males are 22+XY.

Male gametes(sperms) have either X or Y sex chromosome. Female gametes(eggs) can only have X

sex chromosome. A child who inherits an X chromosome from her father will be a girl(XX), and one who inherits a Y chromosome from him will be a boy(XY)

33.Explain the importance of fossils in deciding evolutionary relationships.

Answer

Fossil provide us evidence about

DIRECTORATE OF MINORITIES

→ The organisms that lived long ago such as the time period during which they lived, their structure etc.

→ Evolutionary development of species i.e., line of their development.

→ Connecting links between two groups. For example, feathers present in some dinosaurs means that birds are very closely related to reptiles.

→ Which organisms evolved earlier and which later.

→ Development of complex body designs from the simple body designs.

34. (i) How does relative method help to determine the age of fossils ? (jun 2019)

(ii) "Experiences of an individual during its life time cannot direct evolution."

(iii) "Chromosomes inherited from the father determine the sex of a child." Explain.

Answer :

(i) Gives the information that, fossils which are closer to the surface are most recent than those in deeper layer

(ii) Change in non-reproductive tissues cannot be passed on to the DNA of germ cells. Experiences gained by the organism is not transferred to the DNA and cannot be transferred to the next generation.

(iii) All children will inherit an X chromosome from mother.
Child who inherit an X chromosome from father will be a girl.
Child who inherit an Y chromosome from father will be a boy.

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9. REFRACTION OF LIGHT

Multiple Choice questions

1.According to Snell's law
A.Sin i / Sin r = constant B. Angle i = angle r C. sin i > sin r D sin i = Sin r
Answer:A.Sin i / Sin r = constant

2.Magnitude of magnification less than 1 indicates that the
A. size of the image is greater> size of object
B.size of image = size of object
C.Size of the image < size of object
D.Size of the image is independent of size of object
Answer: C.Size of the image < size of object

3.Which of the following lenses would you prefer to use while reading small letters found in a dictionary?
A.A convex lens of focal length 50 cm. B.A concave lens of focal length 50 cm
C.A convex lens of focal length 5 cm D.A concave lens of focal length 5cm
Answer: C.A convex lens of focal length 5 cm

4.An object placed between F and 2F of a convex lens will produce
A.A virtual image b.A deminished image
C.real and inverted image D.An erect image
Answer:Creal and inverted image

5.According to Cartesian sign convention
A.Object distance is always negative B.Object distance is always positive
C.image distance is always negative D.Image distance is always positive
Answer:A

6.The unit of power of lens is
A.meter B.Centimeter C.Dioptre D.Joule/sec
Answer :C

7.Convex lens gives a real point sized image at the principle focus,when the object is placed
A.At 2F B.At Focus C.At infinity D.F and 2F
Answer:C

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8.In optics an object which has higher refractive index is called

A.Optically denser B.Optically rarer C.Optical density D.refractive index

Answer:A

9.If a power of lens if - 40 D ,Its focal length is

A. 4m B. -40m C.-0.25m D.- 0.025m

Answer:D

10.Where should an object be placed in front of a convex lens to get a real image of the size of the object

A.At the principle focus of the lens B.At twice the focal length

C.between optic centre of the lens and its principal focus D.At infinity

Answer :B

11.Which one of the following materials cannot be used to make a lens

A.water B.glass C.plastic D Clay

Answer:D

12.The refractive index from air to glass is 1.5, and the refractive index of water is 1.33.
What is the refractive index from glass into water?

A. 1.13 B. 2.00 C. 0.50 D. 0.89

Answer:D

13. A ray of light traveling in medium 1 strike and travels into another transparent medium, medium 2. If the speed of light is greater in medium 1, the ray will

A. undergoes total internal reflection.

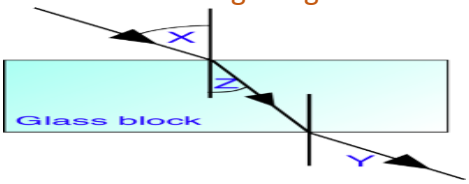
B.refract away from the normal.

C. refract towards the normal.

D. have an angle of incidence smaller than the angle of refraction.

Answer: C refract towards the normal.

14.A ray of light is shone on a rectangular glass block as shown.



Identify X, Y and Z.

A. X = Angle of incidence, Y = Emergent ray, Z = Angle of refraction

B. X = Angle of reflection, Y = Angle of incidence, Z = Normal

C. X = Angle of Refraction, Y = Angle of incidence, Z = Emergent ray

D. X = Angle of incidence, Y = Angle of refraction, Z = Emergent ray

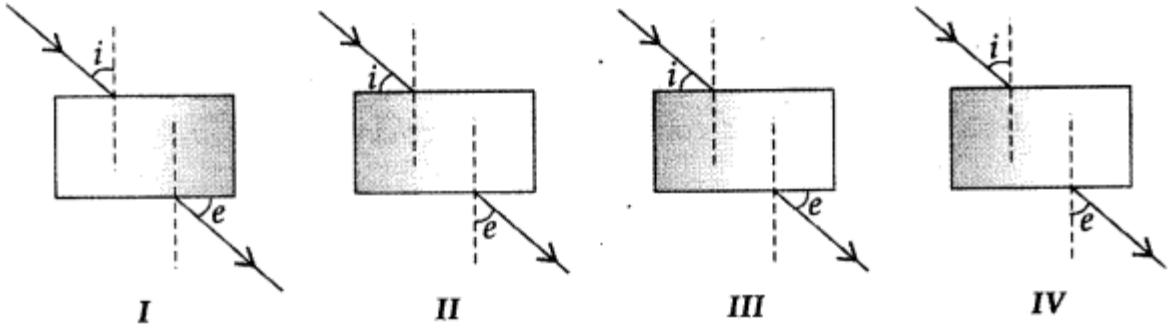
Answer: A. X = Angle of incidence, Y = Emergent ray, Z = Angle of refraction

15. Magnifying power of a concave lens is

A. always > 1 B. always < 1 C. always = 1 D. can have any value

Answer: B

16.A student does the experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He can get a correct measure of the angle of incidence and the angle of emergence by following the labelling indicated in figure:



(a) I (b) II (c) III (d) IV

Answer:D

One mark questions

1.The refractive index of diamond is 2.42.What is the meaning of this statement?

Answer:It means the speed of light in diamond will reduce by a factor 2.42 as compared to its speed in air.

2.Define 1 dioptre of power of lens.

Answer:1 Dioptre is defined as the power of a lens of focal length 1 metre.

3.state the conditions where refraction of light does not occur.

Answer:Light incident normally When there is equal refractive index of two media

4.What is meant by power of lens?

The ability of a lens to converge or diverge the rays of light,is called power of lens.It is equal to the reciprocal of the focal length P=1/f.

5.What is the change in image observed as the object is moved from infinity towards the concave lens?

Answer:The size of the image increases slightly,though it remains small in comparison to the size of the object.

6.Why is the refractive index of atmosphere different at different altitudes?

Answer:Because the air density changes with altitudes.

7.How does the size of the image change as the object is brought closer from infinity towards the convex lens?

Answer:The size of the image keeps on increasing as the object is brought closer towards the convex lens.

8.Why does the light change its path as the medium changes during the transit?

Answer:Because Speed of light is different in different media.

9.Arrange the following substances in the increasing order of refractive indices, Ice,Kerosene,Glass,Diamond,Alcohol,Water.

Answer:Ice<water<Alcohol<kerosene<Glass<diamond.

10.The object distance of lens is -30cm and image distance is-10cm.Find the magnification of the lens.With the help of this ,decide whether the size of the image is smaller or bigger than the size of the object.

Answer:Image distance shows negative value so its concave lens

U= -30, V=-10

M=v/u

M=-10/-30

=1/3

This shows the size of the image is smaller than the size of object.

11. Find the power of a concave lens of focal length 2 m.

Answer- Focal length of concave lens (f) = 2 m

Power of lens (P) = 1/f = 1/ (-2) = -0.5D

12.Define absolute refractive index of a medium.

Answer:It is the ratio of speed of light in vacuum to the speed of light in a medium.

13.On what factors do refractive Index of a material depend?

Answer:1.Nature of an object

2. Density of medium 3.The relative speed of propagation of light.

14. On what factors do the lateral shift (displacement) of light depend during refraction of light?

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Answer:1. Angle of incidence

2. Refractive index of the medium

3. Nature of the medium

4. Wavelength of incident ray.

15.For the same angle of incidence in media P,Q,r ,the angles of refraction are 45®,35® and 15® respectively.in which medium will the velocity of light will be minimum?Give reason for your answer.

Answer:For the same angle of incidence in media P,Q and R,The angle of refraction is minimum for the medium R.hence velocity of light would be minimum in R as c/v=Sin i/Sinr.

Two Marks questions

1.. A doctor has prescribed a corrective lens of power +1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?

Answer-

Power of lens (P) = 1/f

P = 1.5D

f = 1/1.5 = 10/15 = 0.66 m

A convex lens has a positive focal length. Therefore, it is a convex lens or a converging lens.

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2. Find the focal length of a lens of power -2.0 D. What type of lens is this?

Answer-

Power of lens (P) = 1/f

P = -2D

f = -1/2 = -0.5 m

A concave lens has a negative focal length. Therefore, it is a concave lens.

3. A ray of light travelling in air enters obliquely into water. Does the light ray bends towards the normal or away from the normal? Why?

Answer-The light ray bends towards the normal. When a light ray enters from an optically rarer medium (which has low refractive index) to an optically denser medium (which has a high refractive index), its speed slows down and bends towards the normal. As water is optically denser than air, a ray of light entering from air into water will bend towards the normal.

4. Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in vacuum is 3 x 108 ms-1.

Answer-

Refractive index of a medium (nm) = Speed of light in vacuum/Speed of light in the medium

Speed of light in vacuum (c) = 3 × 108 m/s

Refractive index of glass (ng) = 1.50

Speed of light in the glass (v) = Speed of light in vacuum/ Refractive index of glass

= c/ng

=3 × 108/1.50 = 2x 108 ms-1.

5. Find out, from Table, the medium having highest optical density. Also find the medium with lowest optical density.

Material Medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada Balsam	1.53
Ice	1.31	–	–
Water	1.33	Rock salt	1.54
Alcohol	1.36	–	–

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Kerosene	1.44	Carbon disulphide	1.63
Fusedquartz	1.46	Dense flint glass	1.65
Turpentine oil	1.47	Ruby	1.71
Benzene	1.50	Sapphire	1.77
Crownglass	1.52	Diamond	2.42

Answer-

Lowest optical density = Air

Highest optical density = Diamond

The optical density of a medium is directly related to its refractive index. A medium with the highest refractive index will have the highest optical density and vice-versa.

It can be observed from the table that air and diamond respectively have the lowest and highest refractive index. Hence, air has the lowest optical density and diamond has the highest optical density.

6. You are given kerosene, turpentine and water. In which of these does the light travel fastest? Use the information given in Table.

Material Medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada Balsam	1.53
Ice	1.31	–	–
Water	1.33	Rock salt	1.54
Alcohol	1.36	–	–

Kerosene	1.44	Carbon disulphide	1.63
Fused quartz	1.46	Dense flint glass	1.65
Turpentine oil	1.47	Ruby	1.71
Benzene	1.50	Sapphire	1.77
Crown glass	1.52	Diamond	2.42

Answer-

Light travel faster in water as compared to kerosene & turpentine as the refractive index of water is lower than that of kerosene and turpentine. The speed of light is inversely proportional to the refractive index.

7.State two laws of refraction.

Answer (i) The incident ray ,the refracted ray and the normal ray all lie in the same plane.

(II) The ratio of sine of angle of incidence in the first medium to the sine of refraction in teh second medium is a constant.This law is also known as Snell's Law.

8.Mention the kind of lens that can form

i.real,inverted and magnified image

Ans:Convex lens

ii.virtual erect and magnified image

Ans Convex lens

iii.real inverted and diminished image

Ans: convex lens

iv.virtual ,erect and diminished image

Ans:concave lens

9.Briefly describe an activity to find the approximate focal length of a convex lens

Answer:The lens is placed along the path of light –either Sun rays or through electric lamp. The rays converge at a point.The distance between converging point and lens is measured which gives the rough focal length of the convex lens

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10.Draw ray diagram for the formation of image by a concave lens when the object is placed in between infinity and optical centre of the lens.State the nature of the image formed.

Answer:

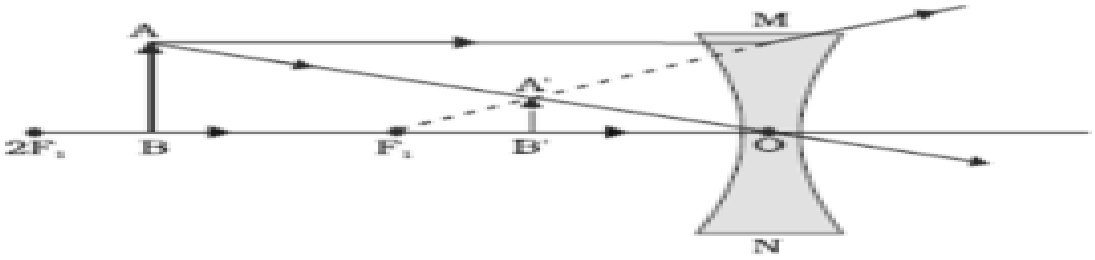


Image is virtual erect and diminished.

11. List out the differences between Real image and Virtual image

Real Image	Virtual Image
1.It can be taken on a screen.	**1. It can't be taken on a screen.**
2. It is always inverted	**2. It is always erect**

12. A converging lens has focal length of 12 cm. Calculate at what distance should the object be placed from the lens so that it forms an image at 48 cm on the other side of the lens.

Answer:

Convex lens (converging lens) Focal length of the lens f = +12 cm Image distance, v= +48 cm Applying the lens formula:

$$\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$$

$$\frac{1}{12}=\frac{1}{48}-\frac{1}{u}$$

$$\frac{1}{u}=\frac{1}{48}-\frac{1}{12}$$

$$\frac{1}{u}=\frac{1}{16}$$

Thus, u=-16 cm

The object should be placed at a distance of 16 cm from the lens.

Three marks questions

1. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convex lens if the image is equal to the size of the object? Also, find the power of the lens.

Answer-

The position of the image should be at 2F since the image is the real and same size.

It is given that the image of the needle is formed at a distance of 50 cm from the convex lens. Therefore, the needle is placed in front of the lens at a distance of 50 cm.

Object distance (u) = – 50 cm

Image distance, (v) = 50 cm

Focal length = f

According to the lens formula,

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

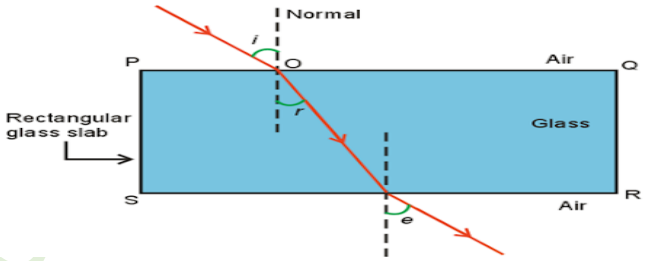
$$\frac{1}{f} = \frac{1}{50} - \frac{1}{-50}$$

$$= \frac{1}{50} + \frac{1}{50} = \frac{1}{25}$$

$$f = 25cm = 0.25m$$

$$Power\ of\ lens,\ P = \frac{1}{f(in\ metres)} = \frac{1}{0.25} = +4D$$

2.Explain the experiment of Refraction through a Rectangular Glass Slab.



Answer:When the light ray is incident on glass slab obliquely it travels from a rarer medium to a denser medium, that is from air to glass and the light ray bends towards the normal. Later the light ray emerging out from the glass slab travels from glass to air that is from a denser medium to a rarer medium and now the light ray bends away from the normal. Emergent ray is parallel to the direction of the incident ray.

3.An object of height 5 cm placed perpendicular to the principal axis of a concave lens of focal length 10 cm. H the distance of the object from the optical center is 20 cm. determine the position, nature and size of the image formed using the lens formula.

Answer:

Given: Object height, h =+5 cm

Focal length, f = -10 cm

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Object distance, u = -20 cm
Applying the lens formula:

$$\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$$
$$\frac{1}{v}-=\frac{1}{f}+\frac{1}{u}$$

Putting values

$$\frac{1}{v}=\frac{1}{-10}+\frac{1}{-20}$$
$$\frac{1}{v}=-\frac{3}{20}$$
$$v=-\frac{20}{3}$$

V=-6.67 cm
Now height of image can be calculated as follows:

$$\frac{h_2}{h_1}=\frac{v}{u}$$
$$\frac{h_2}{5}=-\frac{20}{3}\times-\frac{1}{20}$$
$$h_2=\frac{5}{3}$$
$$h_2=1.67\,\text{cm}$$

therefore, the image formed will be virtual, erect and diminished in size.

4.Explain the following terms related to spherical lenses:
(i) optical center (ii) centers of curvature (iii) principal axis
(iv) aperture (V) principal focus (vi) focal length
Answer:
i.Optical center is defined as the point on the lens which is on the principal axis and the light ray doesn't deflect when passes through it.

(ii) Centre of curvature is defined as the center of the surface of sphere of which the lens is a part. Since, a lens has two surfaces, so the lens has two centers of curvatures.

(iii) Principal axis is defined as the straight lines passing through center of curvature.

(iv)Aperture is defined as the diameter of the boundary of the circular lens.

(v) Principal focus is defined as the point where beam of light parallel to principal axis, either converges or diverges after refraction.

(vi) Focal length is defined as the distance between the optical center and principal focus of the lens.

Four marks questions

1. A concave lens of focal length 15 cm forms an image 10 cm from the lens. How far is the object placed from the lens? Draw the ray diagram.

Answer-

Focal length of concave lens (OF_1), f = – 15 cm

Image distance, v= – 10 cm

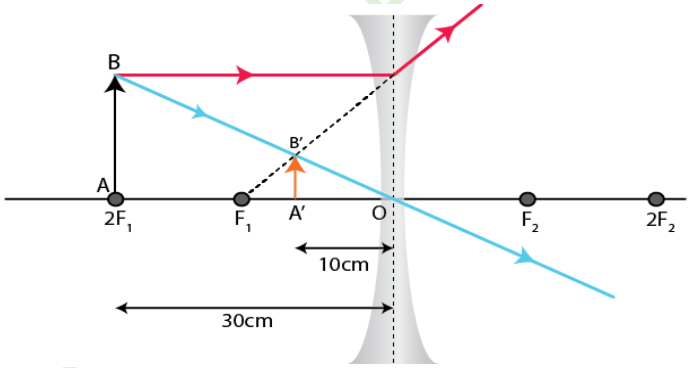
According to the lens formula,

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{u} = \frac{1}{v} - \frac{1}{f} = -\frac{1}{10} - \frac{1}{-15} = -\frac{1}{10} + \frac{1}{15}$$

$$v = -\frac{5}{150} = -30cm$$

The negative value of u indicates that the object is placed 30 cm in front of the lens. This is shown in the following ray diagram.



2. An object 5 cm in length is held 25 cm away from a converging lens of focal length 10 cm. Draw the ray diagram and find the position, size and the nature of the image formed.

Answer-

Height of the Object, h_0 = 5 cm

Distance of the object from converging lens, u = -25 cm

Focal length of a converging lens, f = 10 cm

Using lens formula,

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$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

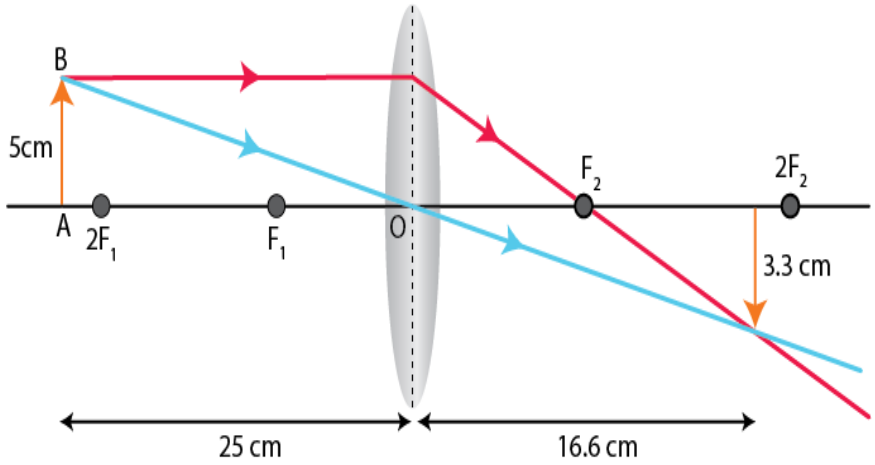
$$\frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{1}{10} - \frac{1}{25} = \frac{15}{250}$$

$$v = \frac{250}{15} = 16.66cm$$

$$Also,\ for\ a\ converging\ lens,\ \frac{h_i}{h_0} = \frac{v}{u}$$

$$h_i = \frac{v}{u} \times h_0 = \frac{50 \times 5}{3 \times (-25)} = \frac{10}{-3} = -3.3cm$$

Thus, the image is inverted and formed at a distance of 16.7 cm behind the lens and measures 3.3 cm. The ray diagram is shown below.



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10. ELECTRICITY

A. Four alternatives are given for each of the following questions. Choose the correct alternative and write the complete answer along with its letter of alphabet.

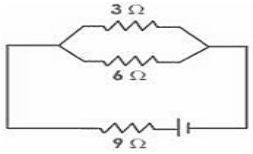
1. What is the amount of current flowing through an electric press, if the amount of charge passing through a conductor in 10 minutes is 300 C?

A. 30 A B. 0.3 A

C. 0.5 A D. 5 A

Answer: C. 0.5 A

2. In the given figure, the resistors



A. 6 Ω, 3 Ω and 9 Ω are in series

B. 9 Ω and 6 Ω are in parallel and the combination is in series with 3 Ω

C. 3 Ω, 6 Ω and 9 Ω are in parallel

D. 3 Ω and 6 Ω are in parallel and the combination is in series with 9 Ω

Answer: D. 3 Ω and 6 Ω are in parallel and the combination is in series with 9 Ω

3. When a current 'I' flows through a resistance 'R' for time't' the electrical energy spent is given by

A. IRt B. I^2Rt

C. IR^2t D. I^2R/t

Answer: B. I^2Rt

4. A wire of resistance R_1 is cut into five equal pieces. These five pieces of wire are then connected in parallel. If the resultant resistance of this combination be R_2, then the ratio R_1/ R_2 is:

A. 1/25 B. 1/5

C. 5 D. 25

Answer: D. 25

5. Which of the given is the SI Unit of Electric Current?

A. Ohm B. Ampere

C. Volt D. Faraday

Answer: B. Ampere

6. A fuse wire is inserted in which wire?

A. Live wire B. In the neutral wire

C. In the earth wire D. May be connected in any line

Answer: A. Live wire

7. The rate of flow of an electric charge is known as:

A. Electric potential B. Electric conductance

C. Electric current D. None of these

Answer: C. Electric current

8. The instrument used for measuring electric current is:

A. Ammeter B. Galvanometer

C. Voltmeter D. Potentiometer

Answer: A. Ammeter

8. The relation between potential difference (V) and current (I) is :

A. V α I2 B. V α 1/I

C. V2 α I D. V α I

Answer:D. V α I

9. Which of the given statements is not true, regarding the electrical set-up for the verification of Ohm's law:

A. The voltmeter is connected in parallel with the known resistance

B. The ammeter is connected in series circuit

C. The rheostat can only increase the resistance in electric circuit

D. The single key is used to switch on/off the electric circuit

Answer:C. The rheostat can only increase the resistance in electric circuit

10. On which of the given resistance does not depend:

A. Length of conductor
B. Area of cross-section
C. Temperature
D. Density

Answer:D. Density

11. Which of the given statements is true regarding ammeter and voltmeter?

A. Ammeter is connected in series with the required device, Voltmeter in parallel
B. Both ammeter and voltmeter are connected in series with required device
C. The voltmeter is connected in series with the device, Ammeter in parallel
D. They can be connected in any way

Answer:A. Ammeter is connected in series with the required device, Voltmeter in parallel

12. An electric heater is rated at 2 Kw. Electrical energy costs Rs 4 per k Wh. What is the cost of using the heater for 3 hours?

A. Rs. 12
B. Rs. 24
C. Rs. 36
D. Rs. 48

Answer:B. Rs. 24

13. The commercial unit of energy is:

A. Watt
B. Watt-hour
C. Kilowatt-hour
D. Kilo-joule

Answer:C. Kilowatt-hour

14. An electric fuse works on the:

A. Chemical effect of current
B. Magnetic effect of current
C. Lighting effect of current
D. Heating effect of current

Answer:D. heating effect of current

15. A car headlight bulb working on a 12 V car battery draws a current of 0.5 A. The resistance of the light bulb is:

A. 0.5 Ω
B. 6 Ω
C. 12 Ω
D. 24 Ω

Answer:D. 24 Ω

16. The resistivity of a certain material is 0.6 Ωm. The material is most likely to be:

A. An insulator
B. A superconductor
C. A conductor
D. A semiconductor

Answer:D. A semiconductor

17. If the amount of electric charge passing through a conductor in 10 minutes is 300 C, the current flowing is:

A. 30 A B. 12.03 A
C. 12.05 A D. 5.00 AM

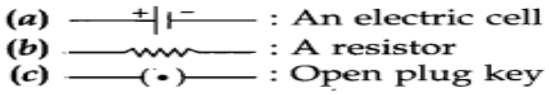
Answer:C. 12.05 A

18. Keeping the potential difference constant, the resistance of a circuit is doubled. The current will become:

A. Double B. Half
C. One-fourth D. Four times

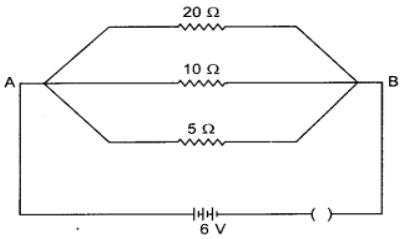
Answer:B. Half

19. Which of the following is not correctly matched?



Answer: C. Open plug key

20. Calculate the current flows through the 10 Ω resistor in the following circuit.



A. 1.2 A B. 0.6 A
C. 0.2 A D. 2.0 A

Answer:B. 0.6 A

B. ONE MARKS QUESTIONS

1. Define electric potential.

Answer: Electric potential at a point in an electric field is defined as the work done in moving a unit positive charge from infinity to that point in the electric field.

2. State the relation between work (W), change (q) and electric potential (V).

Answer:V = W/q

3. What is the S.I. unit of electrical potential?

Answer:volt.

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4. Define 1 volt electric potential.

Answer: Electric potential is said to be 1 volt if 1 Joule of work is done in moving 1 coulomb charge from infinity to a point in the electric field.

5. Name the instrument used to measure the electric potential difference.

Answer: Voltmeter.

6. Write down the relation between the potential difference between two points A and B in a conductor, work done W in moving a unit charge from point B to A and the charge q.

Or

State the relation between work, charge and potential difference for an electric circuit.

Or

Express work done in an electric field in terms of charge and potential difference.

Answer:

$$V_A - V_B = dV = \frac{W}{q}. \quad \text{That is, potential difference} = \frac{\text{Work}}{\text{Charge}}$$

7. Mention the factor that maintains the flow of charge through a conductor.

Answer: Potential difference across the ends of the conductor.

8. Define electric current.

Answer: Electric current is defined as the amount of electric charge flowing through any cross-section of a conductor per unit time.

9. Write down the relation between the electric current I passing in a conductor, change Q flowing in the conductor and time t.

Or

Write the relation between coulomb and ampere.

Answer:

$$I = \frac{Q}{t}. \text{ Therefore, 1 ampere} = \frac{1\,\text{coulomb}}{1\,\text{second}} = 1\ \text{C s}^{-1}$$

10. Define 1 ampere electric current.

Answer: Electric current through a conductor is said to be 1 ampere if 1 coulomb electric charge flows through a cross-section of a conductor in 1 second.

11. How is the direction of electric current related to the direction of flow of electrons in a wire?

Answer: The direction of electric current in a wire is just opposite to the direction of flow of electrons in the wire.

12. Name the instrument used to measure electric current in a circuit.

Answer: Ammeter.

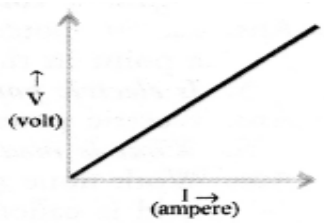
13. Define ohm's law.

Or

State the law that gives the relationship between the potential difference (V) across the two ends of a conductor and the current (I) flowing through it.

Answer: Ohm's law states that *"the electric current flowing through a conductor is directly proportional to the potential difference across the ends of the conductor provided the temperature and other physical conditions of the conductor remain the same"*.

14. Graph is plotted between the values of potential difference (V) and current (I). What v conclusion do you draw about the relation between V and I from this graph. State this relation in your words.



Answer: The potential difference (V) is directly proportional to the current (I).

15. State the formula showing how the current I in a conductor varies with the potential difference V applied across it.

Answer: $V \propto I$ **or** $V = IR$ **or** $I = V/R$

16. Define electrical resistance of a conductor.

Answer: It is the property of a conductor to oppose the flow of electric charge through it.
Resistance of a conductor, R = V/I, where V is the potential difference across the conductor and I is the current flowing through the conductor.

17. "The resistance of a conductor is IΩ". What is meant by this statement ?

Or

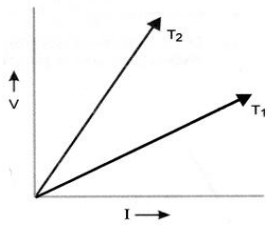
Define 1 ohm resistance.

Answer: The resistance of a conductor is said to be 1Ω if a potential difference of IV across the ends of the conductor makes a current of 1A to flow through it.

18. The voltage — current (V-I) graph of a metallic circuit at two different temperature T_1 and T_2 is shown. Which of the two temperatures is higher and why?

Or

the voltage-current (V-I) graph of a metallic conductor at two different temperatures T_1 and T_2 is shown in figure. At which temperature is the resistance higher?



Answer: Slope of I-V graph = resistance of metallic conductor.
Since, slope of I-V graph at temperature T_2 is greater than the slope of I-V graph at temperature T_1, therefore, resistance at T_2 is greater than resistance at T_1. Since, resistance of a metallic conductor increases with increase in temperature, therefore, $T_2 > T_1$.

19. State the relation between the resistance R of a conductor, resistivity ρ of a conductor, length l of a conductor and area of cross-section A of the conductor.

Or

Write an expression for the resistivity of a substance.

Answer: $R = \frac{\rho l}{A}$ or $\rho = \frac{RA}{l}$,

Where R is the resistance, A is the area of cross-section and l is the length of the substance

20. What is electrical resistivity?

Answer: Electrical resistivity of a material is defined as the resistance of an object (made of the material) of unit length and unit area of cross-section.

21. State SI unit of resistivity.

Answer: ohm-meter (Ω-m).

22. State Joule's law of heating.

Answer: According to Joule's law of heating, the amount of heat produced in a conductor is

1. directly proportional to the square of electric current passing through the conductor,
2. directly proportional to the resistance of the conductor, and
3. directly proportional to the time for which electric current passes through the conductor.

23. Write a mathematical expression for Joule's law of heating. Name one device which works on this principle.

Answer: $H = I^2 Rt$. An electric heater and electric bulb work on Joule's law of heating.

24. What is meant by the statement that the rating of fuse in a circuit is 5A?

Answer: It means maximum current of 5A can pass through the fuse without melting it.

25. Define electric power.

Answer: It is defined as the amount of electric energy consumed in an electric circuit per unit time.

26. State SI unit of electric power.

Answer: Volt x ampere (or Watt).

27. Name the unit used in selling electrical energy to consumers.

Or

what is the commercial unit of energy?

Answer: Kilowatt hour (kWh).

28. Which one is having lesser resistance: A 60 W bulb or a 40 W bulb?

Answer:

$$\text{Power (P)} = \frac{V^2}{R} \quad \therefore R \propto \frac{1}{P}, \text{ if V is constant.}$$

Hence, bulb of higher wattage will have less resistance. In other words, resistance of 60W bulb is less than the resistance of 40 W bulbs.

29. What is the difference between kilowatt and kilowatt hour?

Answer: Kilowatt is the unit of electric power and kilowatt hour is the commercial unit of electric energy.

C. SHORT ANSWER QUESTIONS (2 & 3 MARKS)

1. List two differences between a voltmeter and ammeter.

AMMETER	VOLTMETER
1. Ammeter measures electric current in the circuit.	1. Voltmeter measures the potential difference between two points on a conductor.
2. Ammeter is connected in series in an electric circuit.	2. Voltmeter is connected in parallel across the ends of a conductor or resistor.

2. What is an electric circuit? Distinguish between an open and a closed circuit.

Answer: **electric circuit:**

An electric circuit is a closed conducting path containing a source of electric energy (i.e., a cell or a battery) and a device or element or load (say, an electric bulb) utilizing the electric energy.

The direction of electric current is opposite to the direction of the flow of electrons in the conductor.

Open electric circuit: An electric circuit through which no electric current flows is known as open electric circuit.

The electric circuit showed in figure 10 (A) will be open circuit if the plug of the key is taken out or if the connecting wire breaks from any point.

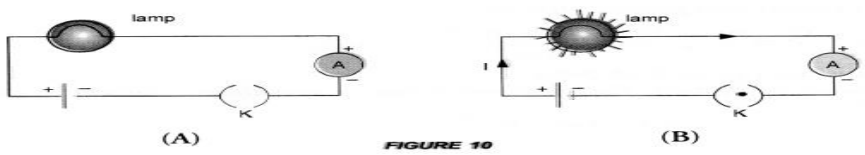


FIGURE 10

Closed circuit: An electric circuit through which electric current flows continuously is known as closed circuit (Figure 10 (B)).

3. An electric heater rated 800 W operates 6h/day. Find the cost of energy to operate it for 30 days at ₹3.00 per unit.

Answer:

Power of the heater, P = 800 W; Time, t = 6 hour/day; No. of days, n = 30;

Cost per unit = ₹3.00; Total cost of its usage = ?; Energy, E = P × t

Consumed in 1 day = 800 × 6 = 4800 Wh

Energy consumed in 30 days = 4800 × 30 = 144000 Wh

$\frac{144000}{1000}$ kWh = 144 units

Cost of 1 unit = ₹3

∴ Cost of 144 units = 3 × 144 = ₹432

4. Explain two disadvantages of series arrangement for household circuit.

Answer: Disadvantages of series circuits for domestic wiring:

- In series circuit, if one electrical appliance stops working due to some defect then all other appliances also stop working because the whole circuit is broken.
- In series circuit, all the electrical appliances have only one switch due to which they cannot be turned off or turned on separately.

5. Give two reasons why different electrical appliances in a domestic circuit are connected in parallel.

Answer: The arrangement of lights and various other electrical appliances in parallel circuits is used in domestic wiring because of following advantages:

- In parallel circuits, if one electrical appliance stops working due to some defect, then all other appliances keep working normally.
- In parallel circuits, each electrical appliance has its own switch due to which it can be turned on or turned off independently, without affecting other appliances.

6. What is meant by overloading of an electrical circuit? Explain two possible causes due to which overloading may occur in household circuit? Explain one precaution that should be taken to avoid the overloading of domestic electric circuit.

Answer:

Overloading: The current flowing in domestic wiring at a particular time depends on the power ratings of the appliances being used. If too many electrical appliances of high power rating are switched on at the same time, they draw extremely large quantity of current from the circuit. This is known as the overloading of the circuit. Due to large current flowing through the wires of the household circuits, their copper wires get heated up to a very high temperature and can cause a fire.

- Precaution: Thus, overloading can be highly damaging to electrical appliances and buildings. So, fuse of proper rating must be used to avoid such damages. Such a fuse-wire will melt before the temperature of the heated circuit wire becomes too high and causes the circuit to break.

7. Give reason for the following:
(i) Electric bulbs are usually filled with chemically inactive gases like nitrogen and argon.
(ii) Copper and aluminium wires are usually employed for electricity transmission.
(iii) Fuse wire is placed in series with the device.
Answer:

(i) Electric bulbs are usually filled with chemically inactive gases like nitrogen and argon because these gases do not react with the hot tungsten filament and hence prolong the life of filament of the electric bulb.

(ii) Copper and aluminium wires are usually employed for electricity transmission because copper and aluminium have very low resistivity and thus they are very good conductors of electricity.

(iii) Fuse wire is placed in series with the device because when large current passes through the circuit the fuse wire gets heated up and melts and whole circuit breaks and the device is protected from the damage.

8. (i) Calculate the current through a lamp of 25 W operating at 250 V.
(ii) Why elements of electrical heating devices are made up of alloys?
Answer:
(i) Power of the lamp, P = 25 W
Potential difference, V = 250 V Current, I = ?
Formula: P = V × I ∴ 25 = 250 × I
∴ Current, I = $\frac{25}{100}$ = $\frac{1}{10}$ = 0.1 A

(ii) The heating elements of electrical heating appliances are made up of nichrome alloy because:

- Nichrome has very high resistivity due to which it produces a lot of heat on passing current.
- Nichrome does not undergo oxidation easily even at high temperature, it can be kept red hot without burning.

9. How is heating effect of electric current used in an electric bulb?
Answer: Electric bulb works on the principle of heating effect of electric current. When electric current passes through a very thin, high resistance tungsten filament of an electric bulb, the filament becomes white hot and emits light.

10. Explain why, the filaments of electric bulbs are made of tungsten.

Answer: The filaments of electric bulbs are made of tungsten because it has a very high resistance. Due to its high resistance, heat produced is high and it becomes white-hot emitting light. Also due to its high melting point (3380° C), it can be kept white hot without melting.

11. A current of 4 A flows through a 12V car headlight bulb for 10 minutes. How much energy transfer occurs during this time?

Answer: Given: I = 4 A, V = 12 V, t = 10 min = 600 s

Energy transferred = VIt = 12 × 4 × 600 = 28800 J.

12. When a 12 V battery is connected across an unknown resistor, there is a current of 2.5 mA in the circuit. Find the value of the resistance of the resistor.

Answer:

Here, V = 12 V, I = 2.5 mA = 2.5×10^{-3} A

Resistance, $R = \frac{V}{I} = \frac{12V}{2.5 \times 10^{-3}} = 4800\ \Omega.$

13. An electric current of 4.0 A flows through a 12 Ω resistor. What is the rate at which heat energy is produced in the resistor?

Answer:

Given: I = 4 A, R = 12 Ω

Rate of production of heat energy, $P = I^2R = 42 \times 12 = 192$ W.

14. Calculate the energy transferred by a 5 A current flowing through a resistor of 2 Ω for 30 minutes.

Answer:

Here, I = 5 A, R = 2 Ω, t = 30 min = 1800 s

Energy transferred = $I^2Rt = (5)^2 \times 2 \times 1800 = 9 \times 10^4$ J.

15. The electrical resistivity of silver is 1.60×10^{-6} Ω m. What will be the resistance of a silver wire of length 10 m and cross-sectional area 2×10^{-3} m2?

Answer:

Given: p = 1.60×10^{-6} Ω m, l = 10 m and A = 2 x 10^{-3} m^2

Resistance, $R = \frac{\rho l}{A} = \frac{1.6 \times 10^{-6} \times 10}{2 \times 10^{-3}} = 8 \times 10^{-3}\ \Omega$

16. Differentiate between Resistance and Resistivity.

Answer:

Resistance:

1. It is the opposition provided by the atoms of a conductor to the flow of electrons.
2. SI unit of resistance is Ω (Ohm).

3. Resistance depends on length, area of cross section, material and temperature of conductor.

Resistivity:

1. It is the resistance of the conductor of that substance of unit length and unit area of cross section.
2. SI unit of Resistivity of Ωm (Ohm-meter).
3. Resistivity of substance depends only on the material of substance.

17. Distinguish between resistances in series and resistances in parallel.

Answer:

Resistances in series:

1. If a number of resistances are connected in such a way that the same current flows through each resistance, then the arrangement is called resistances in series.
2. The current across each resistance is same.
3. The equivalent resistance in series combination is greater than the individual resistances.
4. This combination decreases the current in the circuit.

Resistances in parallel:

1. If a number of resistances are connected between two common points in such a way that the potential differences across each of them is the same, then the arrangement is called resistances in parallel.
2. The voltage across each resistance is same.
3. The equivalent resistance in parallel combination is smaller than each of the individual resistances.
4. This combination increases the current in the circuit.

18. Nichrome wire is used for making the Ideating elements of electrical appliances like iron, geyser, etc. Give reasons.

Answer: Nichrome wire is used for making the heating elements of electrical appliances like iron, geyser, etc. because:

- Nichrome has a very high resistance due to which it produces a lot of heat on passing current.
- It does not undergo oxidation easily even at high temperature due to which it can be kept red hot.

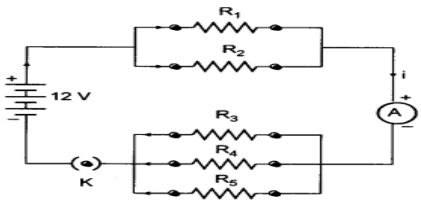
19. What is the better way of connecting lights and other electrical appliances in domestic wiring? Why?

Answer: The better way of connecting lights and other electrical appliances in domestic wiring is parallel connection because of the following advantages:

- In parallel circuit, if one appliance stops working due to some defect, then all other appliances keep working normally.

- In parallel circuit, each electrical appliance has its own switch due to which it can be turned on or off, without affecting other appliances.
- In parallel circuit, each electrical appliance gets the same voltage (220 V) as that of the power supply line.
- In parallel circuit, the overall resistance of the domestic circuit is reduced due to which the current from the power supply is high.

20. If, in Figure R_1 = 10 ohms, R_2 = 40 ohms, R_3, = 30 ohms, R_4 = 20 ohms, R_g = 60 ohms and a 12 volt battery is connected to the arrangement, calculate: (a) the total resistance and (b) the total current flowing in the circuit.



Answer:
(a) Let R' be the equivalent resistance of R_1 and R_2. Then,

$$\frac{1}{R'} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{10} + \frac{1}{40} = \frac{5}{40} = \frac{1}{8}$$

R' = 8Ω
Let R" be the equivalent resistance of R_3, R_4 and R_5. Then,

$$\frac{1}{R''} = \frac{1}{R_3} + \frac{1}{R_4} + \frac{1}{R_5} = \frac{1}{30} + \frac{1}{20} + \frac{1}{60} = \frac{6}{60} = \frac{1}{10}$$

R" = 10 Ω
Total Resistance, R = R' + R" = 8 + 10 = 18 Ω

(b) Current,

$$I = \frac{V}{R} = \frac{12V}{18\Omega} = 0.67 \text{ A.}$$

21. List the factors on which the resistance of a conductor depends.
Answer:

Resistance of a conductor depends on
length of conductor (l)
Area of cross-section (A)
Resistivity of material (ρ)

22. Akbar always switched off lights, fans and electric gadgets when not in use. Her electricity bill had cut down to half.

(a) What is commercial unit of electric energy?
(b) Suggest any two methods of saving electricity,
(c) What values does Akbar show?
Answer:
(a) The commercial unit of electric energy is kWh.
(b) Using LED's and efficient devices.
(c) Self-discipline and responsible behavior.

DIRECTORATE

11.MAGNETIC EFFECTS OF ELECTRIC CURRENT

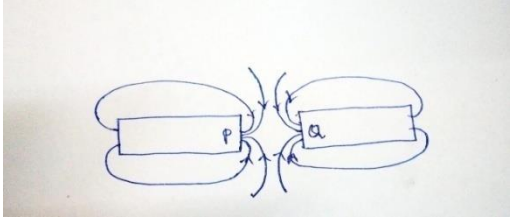
MCQ:

1. Observe the following figure, we can understand that

A. there is a uniform magnetic field around a solenoid
B. magnetic field is same at all points inside the solenoid
C. solenoid is kept in a strong magnetic field
D. solenoid is experiencing mechanical force

Answer: magnetic field is same at all points inside the solenoid

2. Observe the diagram. (SEPT 2020)



The magnetic poles represented by P and Q respectively are

A. south (S) and south (S)
B. north (N) and south (S)
C. north (N) and north (N)
D. south (S) and north (N)

Answer: A. south (S) and south (S)

3. A domestic electric appliance requires alternating current of 15V. If 220V of alternating current is supplied to the house, then the device that helps in the functioning of that electric appliance is. (April 2016)

A. induction coil
B. step up transformer
C. AC dynamo
D. step down transformer

Answer: A. induction coil

4. In Fleming's right hand rule, middle figure indicates the direction of: (April 2016)

A. magnetic field
B. induced electric current
C. mechanical energy
D. motion of the conductor

Answer: B. induced electric current

5. Choose the correct option.

The magnetic field inside a long straight solenoid-carrying current

A. is zero
B. decreases as we move towards its end
C. increases as we move towards its end
D. is the same at all points

Answer: D. is the same at all points

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6. Which of the following property of a proton can change while it moves freely in a magnetic field? (There may be more than one correct answer.)

A. mass B. speed C. velocity D. momentum

Answer: C. velocity and D. momentum

7. A positively-charged particle (alpha-particle) projected towards west is deflected towards north by a magnetic field. The direction of magnetic field is

A. towards south B. towards east C. downward D. upward

Answer: D. upward

8. Choose the correct option.

A rectangular coil of copper wires is rotated in a magnetic field. The direction of the induced current changes once in each

A. two revolutions B. one revolution

C. half revolution D. one- fourth revolution

Answer: C. half revolution

9. Which of the following correctly describes the magnetic field near a long straight wire?

A. The field consists of straight lines perpendicular to the wire

B. The field consists of straight lines parallel to the wire

C. The field consists of radial lines originating from the wire

D. The field consists of concentric circles centred on the wire

Answer: D. The field consists of concentric circles centred on the wire

10. The phenomenon of electromagnetic induction is

A. the process of charging a body

B. the process of generating magnetic field due to a current passing through a coil

C. producing induced current in a coil due to relative motion between a magnet and the coil

D. the process of rotating a coil of an electric motor

Answer: C. producing induced current in a coil due to relative motion between a magnet and the coil

11. The device used for producing electric current is called a

A. generator B. galvanometer C. ammeter D. motor

Answer: A. generator

12. The essential difference between an AC generator and a DC generator is that

A. AC generator has an electromagnet while a DC generator has permanent magnet.

B. DC generator will generate a higher voltage.

C. AC generator will generate a higher voltage.

D. AC generator has slip rings while the DC generator has a commutator.

Answer: D. AC generator has slip rings while the DC generator has a commutator.

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13.At the time of short circuit, the current in the circuit

A. reduces substantially B. does not change

C. increases heavily D. vary continuously

Answer: C. increases heavily

14.The magnetic field lines outside a bar magnet:

A. Originate from the South pole and end at its North Pole

B. Originate from the North pole and end at its East Pole

C. Originate from the North Pole and end at its South Pole

D. Originate from the South pole and end at its West Pole

Answer: C. Originate from the North Pole and end at its South Pole

15.The north pole of Earth's magnet is in the:

A. Geographical South B. Geographical East

C. Geographical West D. Geographical North

Answer: A. Geographical South

16.A soft iron bar is inserted inside a current-carrying solenoid. The magnetic field inside the solenoid:

A. Will decrease B. Will increase

C. Will become zero D. Will remain the same

Answer: D. Will increase

17.A current carrying conductor is held in exactly vertical direction. In order to produce a clockwise magnetic field around the conductor, the current should be passed in the conductor:

A. From top to bottom B. From left to right

C. From bottom to top D. From right to left

Answer: A. From top to bottom

18. The force exerted on a current carrying wire placed in a magnetic field is zero when the angle between wire and the direction of magnetic field is:

A. 45° B. 60° C.90° D.180°

Answer: 180°

19.An induced emf is produced when a magnet is moved into a coil. The magnitude of induced emf does not depend on:

A. The speed with which the magnet is moved B. The number of turns of the coil

C. The resistivity of the wire of the coil D. The strength of the magnet

Answer: The resistivity of the wire of the coil

20.A positive charge is moving towards a person. The direction of magnetic field lines will be in

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Clockwise direction

A. Anticlockwise direction
B. Vertically upward direction
C. Vertically downward direction
D. Clockwise direction

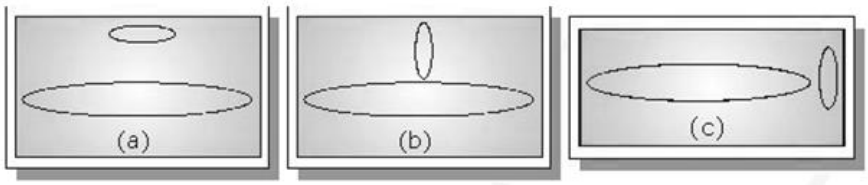
Answer: Anticlockwise direction

21.A fuse should always be placed in the

A. Live wire of the main circuit
B. Neutral wire of the main circuit
C. Earth wire of the main circuit
D. Bothe live and neutral wire of the main circuit.

Answer: Live wire of the main circuit

22.If two circular coils can be arranged in any of the three situations as shown in the diagrams below, then their mutual induction will be:



A. Maximum in situation a
B. Maximum in situation b
C. Maximum in situation c
D. The same in all situations

Answer: Maximum in situation a

23.A coil of insulated copper wire is connected to a galvanometer forming a loop and a magnet is:

A: Held stationary
B: Moved away along its axis
C: Moved towards along its axis
D. There will be a induced current in:

A. A only B. A and B only C.B and C only D. A, B and C

Answer: B and C only

24.The shape of the magnetic field lines produced by a current carrying conductor is:

A. Straight lines B. Concentric circles C. Concentric ellipse D. Concentric parabolas

Answer: Concentric circle

25.An electric motor is a device which transforms

A. Mechanical energy into electrical energy
B. Electrical energy into mechanical energy
C. Kinetic energy into potential energy
D. Electrical energy into Potential energy

Answer: Electrical energy into mechanical energy

26.Which of the following diagrams correctly shows the magnetic field produced by a current- carrying wire?

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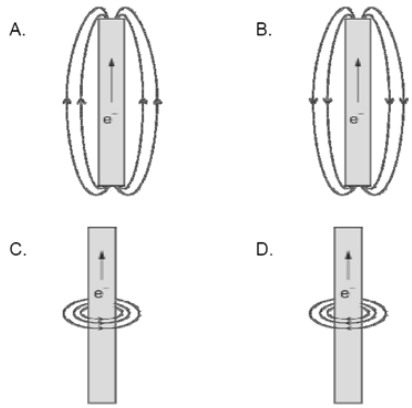


A. A B.B C.C D.D

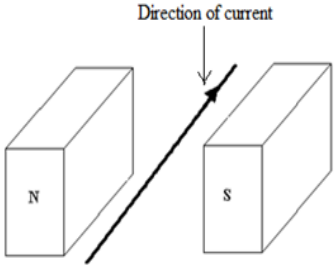
Answer: D. D

27.The frequency of electricity produced by DC generator is equal to

A. 0 Hz B.50 Hz C.100 Hz D.200 Hz

Answer: 0 Hz

28.A current flows in a wire running between the S and N poles of a magnet lying horizontally as shown in the figure below:



The force on the wire due to the magnet is directed:

A. From N to S B. From S to N

C. Vertically downwards D. Vertically upwards

Answer: (c) Vertically downwards

29. In Right hand thumb rule, thumb indicates the direction of------

A. Current B. Motion of conductor

C. Magnetic force D. Mechanical force

ONE MARK QUESTIONS:

30. Why does a compass needle get deflected when brought near a bar magnet?

Answer: The needle of a compass is a small magnet. That's why when a compass needle is brought near a bar magnet, its magnetic field lines interact with that of the bar magnet. Hence, a compass needle gets deflected.

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31. Why don't two magnetic lines of force intersect each other?

Answer: The two magnetic field lines do not intersect each other because if they do it means at the point of intersect the compass needle is showing two different directions which is not possible.

32. State Fleming's left-hand rule.

Answer: Fleming's left hand rule states that if we arrange the thumb, the centre finger, and the forefinger of the left hand at right angles to each other, then the thumb points towards the direction of the magnetic force, the centre finger gives the direction of current , and the forefinger points in the direction of magnetic field.

33. What is the principle of an electric motor?

Answer: The principle of an electric motor is based on the magnetic effect of electric current. A current-carrying loop experiences a force and rotates when placed in a magnetic field. The direction of rotation of the loop is according to the Fleming's left-hand rule.

34. What is the role of the split ring in an electric motor?

Answer: The split ring in the electric motor also known as a commutator reverses the direction of current flowing through the coil after every half rotation of the coil. Due to this the coil continues to rotate in the same direction.

35. State the principle of an electric generator.

Answer: Electric generator works on the principle of electromagnetic induction. Electricity is generated by rotating a coil inside magnetic field.

36. Name some sources of direct current.

Answer: Some sources of direct current are cell, DC generator, etc.

37. Which sources produce alternating current?

Answer: AC generators, power plants, etc., produce alternating current.

38. When is the force experienced by a current-carrying conductor placed in a magnetic field largest?

Answer: The force experienced by a current-currying conductor is the maximum when the direction of current is perpendicular to the direction of the magnetic field.

39. Name some devices in which electric motors are used?

Answer: Some devices in which electric motors are Water pumps, Electric fans, Electric mixers and Washing machines.

40. When does an electric short circuit occur?

Answer: If the insulation of the wires used in the circuit is damaged or the appliance used is faulty due to which the live wire and the neutral wire comes in direct contact as a result current in the circuit rises and the short circuit occurs.

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41. What is a solenoid?

Answer: Coil of many circular turns of insulated copper wire wrapped closely in cylindrical form.

42. Define electromagnetic induction.

Answer: The process by which a changing magnetic field in a conductor induces a current in anotherconductor.

43. What is the advantage of alternate current?

Answer: It can be transmitted over long distance without much loss of energy.

44. Name two safety measures commonly used in electric circuits and appliances.

Answer: I. Use of earth wire and proper earthing.

ii. Use of fuse

45. State the Flemings right hand rule. (April 2019)

Answer: Stretch the thumb, forefinger and middle finger in such way that they are perpendicular to each other

- Forefinger shows the magnetic field
- Thumb finger shows the motion of conductor
- Middle finger shows induced current

TWO MARK QUESTIONS:

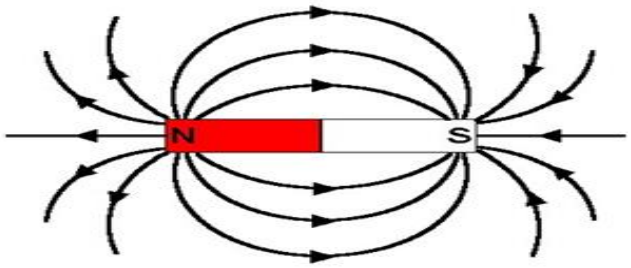
46. List the properties of magnetic lines of force. (April 2019)

Answer: The properties of magnetic lines of force are as follows.

- Magnetic field lines emerge from the north pole.
- They merge at the south pole.
- The direction of field lines inside the magnet is from the south pole to the north pole.
- Magnetic lines do not intersect with each other.

47. Draw magnetic field lines around a bar magnet.

Answer: Magnetic field lines of a bar magnet emerge from the North Pole and terminate at the South Pole. Inside the magnet, the field lines emerge from the South Pole and terminate at the North Pole, as shown in the given figure.



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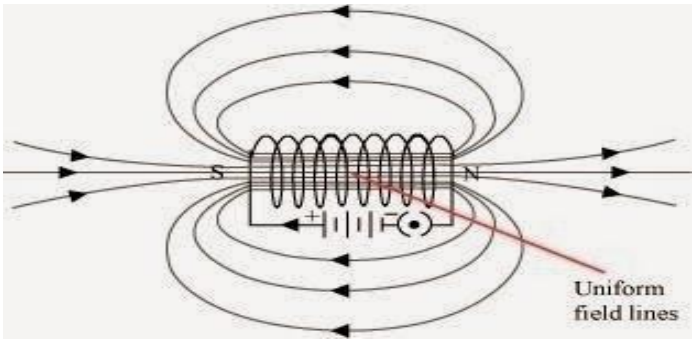
48. The magnetic field in a given region is uniform. Draw a diagram to represent it.

Answer:



The magnetic field lines inside a current-carrying long straight solenoid are uniform.

49. Explain different ways to induce current in a coil.

Answer: The different ways to induce current in a coil are as follows:

- If a coil is moved rapidly between the two poles of a horse-shoe magnet, then an electric current is induced in the coil.
- If a magnet is moved relative to a coil, then an electric current is induced in the coil.

50. Name two safety measures commonly used in electric circuits and appliances.

Answer: Two safety measures commonly used in electric circuits and appliances are

- Electric Fuse: An electric fuse is connected in series it protects the circuit from overloading and prevents it from short circuiting.
- Proper earthing of all electric circuit in which any leakage of current in an electric appliance is transferred to the ground and people using the appliance do not get the shock.

51. An electric oven of 2 kW is operated in a domestic electric circuit (220 *V*) that has a current rating of 5 A. What result do you expect? Explain.

Answer: Current drawn by the electric oven can be obtained by the expression,

$P = VI$

Where,

Current = I

Power of the oven, P = 2 kW = 2000 W

Voltage supplied, V = 220 V

I = 2000/220 V = 9.09 A

Hence, the current drawn by the electric oven is 9.09 A, which exceeds the safe limit of the circuit. Fuse element of the electric fuse will melt and break the circuit.

52. What precaution should be taken to avoid the overloading of domestic electric circuits? (Sept 2020)

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Answer: The precautions that should be taken to avoid the overloading of domestic circuits are as follows:

- Too many appliances should not be connected to a single socket.
- Too many appliances should not be used at the same time.
- Faulty appliances should not be connected in the circuit.

Fuse should be connected in the circuit.

53. List three sources of magnetic fields.

Answer: Three sources of magnetic fields are as follows:

- Current-carrying conductors
- Permanent magnets
- Electromagnets

54. Imagine that you are sitting in a chamber with your back to one wall. An electron beam, moving horizontally from back wall towards the front wall, is deflected by a strong magnetic field to your right side. What is the direction of magnetic field?

Answer:

- The direction of the magnetic field is vertically downwards. The direction of current is from the front wall to the back wall because negatively charged electrons are moving from back wall to the front wall.
- The direction of magnetic force is rightward. Hence, using Fleming's left hand rule, it can be concluded that the direction of magnetic field inside the chamber is downward.

55. Two circular coils A and B are placed closed to each other. If the current in the coil A is changed, will some current be induced in the coil B? Give reason.

Answer:

- Two circular coils A and B are placed close to each other. When the current in coil A is changed, the magnetic field associated with it also changes.
- As a result, the magnetic field around coil B also changes. This change in magnetic field lines around coil B induces an electric current in it. This is called electromagnetic induction.

56. What is the function of an earth wire? Why is it necessary to earth metallic appliances?

Answer:

The metallic body of electric appliances is connected to the earth by means of earth wire so that any leakage of electric current is transferred to the ground. This prevents any electric shock to the user. That is why earthing of the electrical appliances is necessary.

57. Differentiate between generator and motor.

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Generator	Motor
Converts mechanical energy into electrical Energy	Converts electrical energy into mechanicalenergy.
Principle: Electromagnetic induction and Flemings right hand rule	Magnetic effect of electric current and Flemings left hand rule

58. Suggest any two measures to avoid overloading in domestic circuits. (sep 2020)

Answer:

- Live and neutral wires should not come into direct contact.
- There should not be any short –circuit in the circuit
- Too many appliances should not be connected to a single socket.
- Should always use quality wires and good quality electrical appliances.

THREE MARK QUESTIONS:

59. A coil of insulated copper wire is connected to a galvanometer. What will happen if a bar magnet is (i) pushed into the coil, (ii) withdrawn from inside the coil, (iii) held stationary inside the coil?

Answer:

(i) The needle of the galvanometer shows a momentary deflection in a particular direction.
(ii) The needle of the galvanometer shows a momentarily in the opposite direction.
(iii) The needle of the galvanometer shows no deflection.

60. State the rule to determine the direction of a
(i) Magnetic field produced around a straight conductor-carrying current
(ii) Force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it, and
(iii) Current induced in a coil due to its rotation in a magnetic field.

Answer: (i) Maxwell's right hand thumb rule
(ii) Fleming's left hand rule
(iii) Fleming's right hand rule

FOUR MARK QUESTIONS:

61. How does a solenoid behave like a magnet? Can you determine the north and south poles of a current-carrying solenoid with the help of a bar magnet? Explain.

Answer:

- A solenoid is a long coil of circular loops of insulated copper wire.

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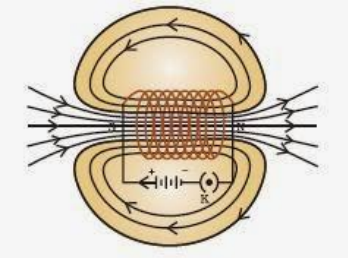
- Magnetic field lines are produced around the solenoid when a current is allowed to flow through it.
- The magnetic field produced by it is similar to the magnetic field of a bar magnet. The field lines produced in a current-carrying solenoid is shown in the following figure.



- In the above figure, when the north pole of a bar magnet is brought near the end connected to the negative terminal of the battery, the solenoid repels the bar magnet.
- Since like poles repel each other, the end connected to the negative terminal of the battery behaves as the north pole of the solenoid and the other end behaves as a south pole.
- Hence, one end of the solenoid behaves as a north pole and the other end behaves as a south pole.

62. Define magnetic field. State the characteristics of Field Lines.

Answer: The area around a magnet in which its magnetic force can be experienced.

(i) Field lines arise from North Pole and end into South pole of the magnet.

(ii) Field lines never intersect each other.

(iii) Field lines are closer in stronger magnetic field.

(iv) Field lines are closed curves.

63.(i) How does overload and short – circuit occur in an electric circuit? Explain .What is the function of fuse during this situation?

(ii) Mention two properties of magnetic field lines. (April 2019)

Answer:

(i) Overloading can occur when the live wire and the neutral wire come into direct contact

- This occurs when the insulation of wire is damaged or there is a fault in the appliance/ when many electrical appliances are connected to the one circit simultaneously.
- In such situation the current in the circuit abruptly increases and short circuit occurs.
- The heating that takes place in the fuse melts it to break the electric circuit , and prevents the electric circuit and the appliance from a possible damage

(ii)

- No of field lines are found to cross each other.
- The density of the magnetic field lines are more in their poles.

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- The magnetic field lines emerge from north pole and merge at south pole.
- Inside the magnet the direction of field lines is from its south pole to its north pole.
- Thus the magnetic field lines are closed curves.

64. How do you trace the magnetic field lines around a bar magnet using compass needle? Explain. (June 2020)

Answer:

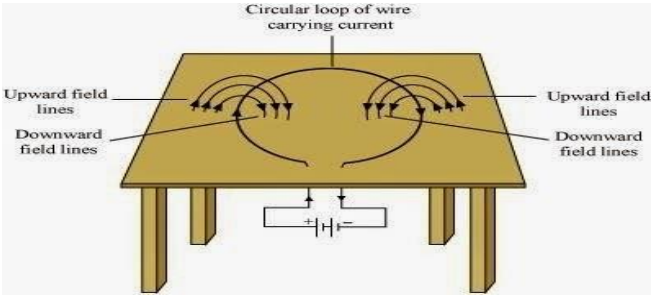
- Take a small compass and a bar magnet. Place a magnet on a sheet of white paper fixed on a drawing board. Mark the boundary of the magnet.
- Place the compass near the north pole of the magnet, mark the positions of two ends of the needle.
- Now move the needle to a new position such that south pole occupies the position previously occupied by its north pole.
- In this way proceed step by step till we reach the south pole of the magnet. Join the points marked on the paper by a smooth curve. This represents field line.
- Repeating above procedure we can draw as many lines as possible.

FIVE MARK QUESTIONS:

65. Consider a circular loop of wire lying in the plane of the table. Let the current pass through the loop clockwise. Apply the right-hand rule to find out the direction of the magnetic field inside and outside the loop.

Answer:

- Inside the loop = Pierce inside the table
- Outside the loop = Appear to emerge out from the table
- For downward direction of current flowing in the circular loop, the direction of magnetic field lines will be as if they are emerging from the table outside the loop and merging in the table inside the loop.
- Similarly, for upward direction of current flowing in the circular loop, the direction of magnetic field lines will be as if they are emerging from the table outside the loop and merging in the table inside the loop, as shown in the given figure.



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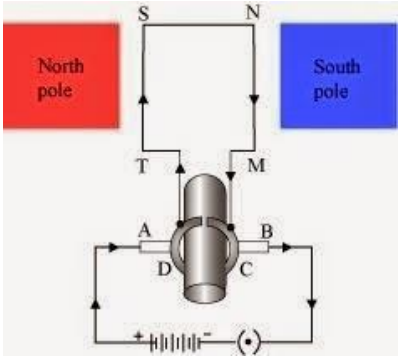
66. Draw a neat labelled diagram of an electric motor. Explain its principle and working. What is the function of a split ring in an electric motor?

Answer: **Principle:** It works on the principle of the magnetic effect of current. A current-carrying coil rotates in a magnetic field.



Working:

- When a current is allowed to flow through the coil MNST by closing the switch, the coil starts rotating anti-clockwise. This happens because a downward force acts on length MN and at the same time, an upward force acts on length ST. As a result, the coil rotates anti-clockwise.,
- Current in the length MN flows from M to N and the magnetic field acts from left to right, normal to length MN. Therefore, according to Fleming's left hand rule, a downward force acts on the length MN.
- Similarly, current in the length ST flows from S to T and the magnetic field acts from left to right, normal to the flow of current.
- Therefore, an upward force acts on the length ST. These two forces cause the coil to rotate anti-clockwise.
- After half a rotation, the position of MN and ST interchange. The half-ring D comes in contact with brush A and half-ring C comes in contact with brush B. Hence, the direction of current in the coil MNST gets reversed.
- The current flows through the coil in the direction TSNM. The reversal of current through the coil MNST repeats after each half rotation. As a result, the coil rotates unidirectional.
- The split rings help to reverse the direction of current in the circuit. These are called the commutator.

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12. SOURCES OF ENERGY

Q. No.	Multiple Choose Questions
1.	Which is the ultimate source of energy? (a) Water (b) Sun (c) Uranium (d) Fossil fuels Ans: **(b) Sun.**
2	A good fuel is one that possesses: (a) High calorific value and low ignition temperature (b) Low calorific value and low ignition temperature (c) High calorific value and moderate ignition temperature (d) Low calorific value and moderate ignition temperature Ans : **(c) High calorific value and moderate ignition temperature**
3	The main constituent of biogas is (a) methane (b) carbon dioxide (c) hydrogen (d) hydrogen sulphide Ans : **(a) methane**
4	The power generated in a windmill (a) is more in rainy season since damp air would mean more air mass hitting the blades (b) depends on the height of the tower (c) depends on wind velocity (d) can be increased by planting tall trees close to the tower Ans : **(c) depends on wind velocity**
5	In a hydroelectric power plant more electrical power can be generated if water falls from a greater height because (a) its temperature increases (b) larger amount of potential energy is converted into kinetic energy (c) the electricity content of water increases with height (d) more water molecules dissociate into ions Ans : **(b) larger amount of potential energy is converted into kinetic energy.**
6	In a hydro power plant (a) potential energy possessed by stored water is converted into electricity (b) kinetic energy possessed by stored water is converted into potential energy (c) electricity is extracted from water (d) water is converted into steam to produce electricity Ans : **(a) potential energy possessed by stored water is converted into electricity.**
7	Choose the incorrect statement regarding wind power. (a) It is expected to harness wind power to minimum in open space. (b) The potential energy content of wind blowing at high altitudes is the source of wind power. (c) Wind hitting the blades of a windmill causes them to rotate. The rotation thus achieved can be utilised further.

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	(d) One possible method of utilising the energy of rotational motion of the blades of a windmill is to run the turbine of an electric generator. Ans : **(b) The potential energy content of wind blowing at high altitudes is the source of wind power.**
8	Choose the incorrect statement. (a) We are encouraged to plant more trees so as to ensure clean environment and also provide biomass fuel. (b) Gobar gas is produced when crops, vegetable wastes, etc., decompose in the absence of oxygen. (c) The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash. (d) Biomass is a renewable source of energy. Ans: **(c) The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash.**
9	Which method is used to produce electricity in thermal power plant? A. By heating chargeable cells B. By boiling water C. By pushing pistons by heat energy D. Any of these. Ans : **B. By boiling water**
10	Choose the incorrect statement. A. We are encouraged to plant more trees so as to ensure clean environment and also provide biomass fuel B Gobar-gas is produced when crops, vegetable wastes etc., decompose in the absence of oxygen C. The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash D. Bio-mass is a renewable source of energy. Ans : **C. The main ingredient of biogas is ethane and it gives a lot of smoke and also produces a lot of residual ash.**
11	Quality of fuel is measured by A. Calorific value B. Combustion value C. Initial value D. None of these Ans : **A. Calorific value.**
12	Which of the given is not an example of a bio-mass energy source? A. Wood B. Gobar-gas C. Wind energy D. Coal Ans : **C. Wind energy**
13	The country of winds is A. Indian B. China C. Denmark D. Netherlands Ans : **C. Denmark**
14	The main constituent of CNG is. a) Butane. b) Methane. c) Ethane. d) Propane. Ans : **b) Methane.**
15	Biogas is a better fuel than animal dung cake because (a) Biogas has lower calorific value. (b) animal dung cake has high calorific value (c) biogas bums smoke and leaves no residue (d) Biogas is used as a fuel for cooking only whereas dung cake can be used for cooking, illuminate the lanterns.

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	Ans : **(c) Biogas has high calorific value and leave no residue, no smoke after burning and can be used for domestic purpose, running engines and in gas lanterns for illumination.**
16	Spent slurry (Bio-waste after obtaining biogas) is used as (a) fuel (b) manure (c) food for livestock (d) used again for generating biogas Ans: **(b) manure**
17	Natural gas is better fossil fuel because: (a) It is formed by decomposition of plants and animals. (b) It is found in gas form (c) It is costly (d) It is smokeless and no ash is left Answer: Ans : **(d) It is smokeless and no ash is left.**
18	What is the wind speed required for harnessing wind energy by wind mills. a) 60 km/h b) 15 km/h c) 45km/h d) 5 km/h Ans : **b) 15 km/h**
19	The largest wind energy farm has been established in india is ? a) Jaisalmer wind park b) Tuppadahalli wind farm c) Damanjodi wind farm d) Kanyakumari wind farm Ans : **d) Kanyakumari wind farm**
20	Which of the following is not disadvantage of construction of dam? a) Give rise large amount of methane. b) Large eco-systems are destroyed. c) Submerged large agricultural land. d) Irrigated large agricultural area. Ans: **d) Irrigated large agricultural area.**
	One Marks Questions
21	What is a good source of energy? Ans: **The energy which is easily available, cheap, does not produce pollution is said to be good source.**
22	What is a good fuel? Ans: **A good fuel is one which is cheap, easily available, easy to handle, transport, has proper ignition temperature and high calorific value.**
23	If you could use any one of the following source of energy for heating your food, which one would you use? And why? Cow dung, Bio-gas, and LPG Ans: **Bio-gas. Because it is pollution free and renewable.**
24	How has the traditional use of wind and water energy been modified for our convenience? Ans: **(i) The traditional use of water energy has been modified and we have built dams, turbines and dynamos to generate electricity with the help of flow of water.** **(ii) Wind; energy is used to rotate the wind mills, turbines and generate electricity by constructing wind fans.**
25	How does construction of dams across the river get linked with production of greenhouse gases? Ans:**A vast variety of plants get submerged in water, rot under anaerobic conditions and produce large amount of greenhouse gases such as methane.**
26	How is the increase in demand for energy affecting our environment adversely? Ans: **More use of fossil fuels for fulfilling the increasing demand for energy is polluting the air,**

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	which is a great health hazard.
27	What is the disadvantage of a thermal power plant? Ans: **The burning of coal or oil in a thermal power plant released gases causes air pollution and global warming.**
28	Justify in one sentence that hydro power is a renewable source of energy. Ans: **Hydro powers source is renewed by water cycle. So it is a renewable source of energy.**
29	What is bio-mass? Ans: **Plants and animals waste material which can be used as fuel is called bio-mass.**
30	What is bio-gas? Ans: **Biogas is a mixture of four gases namely methane , carbon dioxide, hydrogen and hydrogen sulphide.**
31	Mention one feature of biogas that makes it an ideal fuel. Ans: **It cannot produce air pollution and residue.**
32	Name the main constituent of a biogas and its approximate percentage content in it. Ans:**Methane gas. 75% of total volume.**
33	Name two main combustible components of biogas. Ans: **Methane gas and hydrogen gas**
34	List two nutrients that the slurry left behind in the biogas plant contains. Ans: **Nitrogen and phosphorus, on Wind energy**
35	What is the main basic cause for winds to blow? Ans: **The pressure of a region where maximum sunlight falls decreases as compared to the region where minimum sunlight falls. The air moves from a region of high pressure (i.e., cold region) to the region of low pressure (i.e., hot region). This moving air is the wind.**
36	Name the kind of energy possessed by wind. Ans: **Kinetic energy.**
37	Wind mill is used to produce electricity. Write the sequence of energy conversion in a wind mill. Ans: **Wind energy —> Mechanical energy —> Electric energy**
	Two Marks Questions
38	Write any four advantages of hydroelectric power. Or List two advantages of producing hydroelectricity. Ans: **Advantages of Hydroelectric Power** **1. Hydroelectric power is pollution free.** **2. hydroelectric power- is dependable source of energy.** **3. Lot of water is available in rivers, so the hydroelectric power is available free of cost. Money is spent only to construct dams and power stations.**

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39	What is the importance of hydropower plants in India? Describe how electric energy is generated in such plants. Ans: **In India, hydropower plants fulfils l/4th or 25% demand for the total energy requirement.** **Hydro Power or Hydro Electric Power Plant:** **Flowing water is the major source of energy. The electricity produced by the flowing water is known as hydro-electric power. A plant used to produce hydro-electric power is known as hydro-electric power plant (For the generation of electric energy in hydropower plant).**
40	What are the advantages of constructing dams over rivers. Ans: **Dams are helpful to :** **1. Control floods over rivers.** **2. Generate hydroelectricity.** **3. Irrigate agriculture land.** **4. develop water sports for recreation** **5. develop fishing zones**
41	Name four gases commonly present in biogas. Or List four gases generated in a biogas plant. Ans: **Methane, CO2, hydrogen, Hydrogen**
42	List two advantages of using biogas over fossil fuels. Ans: **1. Biogas does not produce smoke during burning and hence there in no air pollution.** **2. It is a cheaper source of energy.**
43	How does biogas plant help to reduce the problem of pollution? Ans: **1. Biogas obtained from biogas plant does not produce smoke during burning and hence there is no air pollution.** **2. Biogas plant operates with the materials like cow dung and waste of plants. These materials lying in open can cause air and water pollution.**
44	Suggest two materials that can be used to produce bio-gas. Mention two uses of bio-gas and two advantages of bio-gas plant. Ans: **1. Animal wastes like cow-dung** **2. Fruits and vegetable wastes.** **Uses : Bio-gas is used to cook food and heat water.** **Advantages of bio-gas plant :** **1. It causes no pollution.** **2. The slurry in bio-gas plant is used as manure by the farmers.**
45	Biogas is considered to be a boon to the farmers. Give reasons. Or List any three reasons due to which bio-gas is considered to be an excellent fuel.

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	Ans: **1. Bio-gas is pollution free.** **2. It is cheap as raw material {i.e., cow dung and waste of plants and vegetables) to produce biogas is available free of cost to the farmers.** **3. The remains or used slurry in a bio-gas plant is used as manure by the farmers in the fields to get good yields of crops.**
46	Name an efficient fuel obtained from cow dung and other animal and plant wastes. Also mention its main constituent. Ans: **Biogas. Methane and hydrogen gases**
47	Mention any two uses of wind energy. Ans: **Wind energy is used to** **1. operate water pumps to draw underground water,** **2. produce electricity**
48	What are the limitations in obtaining energy from wind? Ans: **1. We cannot depend upon wind energy as it is available only when air is in motion. The appliances or machines operating with wind energy stop working as soon as wind stops. The minimum speed of wind to operate generator to produce electricity is about 15 km/h. As soon as the speed of the wind becomes less than 15 km/h, the generator stops working.** **2. There are certain regions where wind is not available, so the use of wind energy is limited to certain places where wind is in plenty and blows most of the time.** **3. Wind energy is not sufficient to operate very heavy machines.** **4. Wind energy cannot be used to operate all types of machines.** **5. Wind mills are usually broken during storms and hence lot of money is spent for the maintenance of a wind energy form(any two)**
49	Explain the working of a wind mill. Ans: **When wind blows with a minimum speed of 15 km/h, the kinetic energy of the wind is used to rotate the blades of wind mill. The rotational energy of the blades is used to rotate the armature of the generator to produce electricity.**
50	Compare and contrast bio-mass and hydroelectricity as sources of energy. Ans:

Bio-mass as Energy Source	**Hydroelectricity as Energy Source**
1. It causes pollution.	**1. It does not cause pollution.**
2. It is cheap and easily available.	**2. It is expensive and not easily available.**
3. Initial cost for building the bio-gas plant is very cheap and its maintenance is also cheap.	**3. The initial cost of building the power plant is expensive; its maintenance is also expensive.**

51	What are the limitations of extracting energy from the wind? Ans: **(i) It can be extracted only at limited sites where the wind blows most of the time in a year.** **(ii) The minimum speed of wind should be 15 km/h.**

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	(iii) Large area is required to build the wind farm/wind mills which is expensive affair. **(iv) Efficiency is low.**
52	On what basis would you classify energy sources as (a) Renewable and non-renewable? (b) Exhaustible and inexhaustible? Ans: **Both (a) and (b) options are same:**

Renewable/Inexhaustible	**Non- Renewable/exhaustible**
1. They are also called inexhaustible	**1. They are also called exhaustible**
2. They are Pollution free.	**2. They are Pollutant.**
3. They are Abundant	**3. They are less quantity.**
4. e.g., sun, wind, water.	**4. e.g., fossil fuels-petrol, coal.**

53	What are the qualities of an ideal source of energy? Ans: **The ideal source should have the following qualities:** **1. should be cheap, easily available and easy to handle.** **2. It can be transported easily.** **3. It should have high calorific value.** **4. It should have proper ignition. temperature.**
54	How do technological inputs improve the efficiency of biomass fuels? Ans: **Traditional uses of biomass fuels are not only efficient but they also produce a lot of pollutants which are hazardous to health. Therefore, technological inputs are necessary to improve the efficiency of these fuels and make them environment friendly. With the help of technology, smokeless chulhas and biogas plants have been designed.**
55	Mention any four limitations in harnessing wind energy on a large scale. Ans: **<u>Limitations in harnessing wind energy are</u>:** **1. Speed of wind is not available at all time and at all places.** **2. To establish the wind energy farm, a large area of land is needed.** **3. Speed of wind should be higher than 15 km/h to harness the wind energy.** **4. Construction of windmill and its installation is very expensive.**
56	Why Charcoal is considered to be a better fuel than wood? Ans: **because:** **1. Charcoal burns without flames.** **2. Charcoal is comparatively smokeless.** **3. Charcoal has higher calorific value, i.e. higher heat generating efficiency than wood.**
57	How does biogas plant help to reduce the problem of pollution? Ans: **<u>Biogas plant helps to reduce the problem of pollution in the following ways.</u>** **1. It provides better sanitation due to safe disposal of bio-waste and sewage material.** **2. Biogas obtained from this plant produces less smoke on burning. (Hi) The residue left can be used as manure which can be used as an alternative of fertilizers. Thus, it prevents soil and water from degradation.**

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58	Name four gases commonly present in biogas. State two advantages of using this gas over fossil fuels. Ans: **Methane, carbon dioxide, hydrogen and hydrogen sulphide.** **<u>Advantages of using biogas over fossil fuels are:</u>** **1. Biogas burns without smoke, leaves no residue unlike coal.** **2. Biogas is cheaper as compared to fossil fuels.**
59	Compare and contrast bio-mass and hydroelectricity as sources of energy. Ans: • **Bio-mass and hydro-electricity both are renewable sources of energy. Bio-mass is derived from dead plants and animal wastes.** • **Hence, it is naturally replenished. It is the result of natural processes. Wood, gobargas, etc. are some of the examples of bio-mass.** • **Hydro-electricity, on the other hand, is obtained from the potential energy stored in water at a height.** • **Energy from it can be produced again and again. It is harnessed from water and obtained from mechanical processes.**
	Three Marks Questions
60	Describe how hydro energy can be converted into electrical energy. Write any two limitations of hydro energy. Ans: **<u>Conversion of hydro energy into electrical energy</u>** **1. High rise dams are constructed on the river to obstruct the flow of water to collect it at a suitable height. The stored water has a lot of potential energy.** **2. The water from a suitable height is allowed to fall on the blades of a turbine located at the bottom of a dam through a pipe.** **3. Kinetic energy of flowing water rotates the turbine rapidly. Rotation of turbine helps the armature coil of generator to rotate rapidly in the magnetic field. Thus, hydroelectricity is generated.** **<u>Limitations of hydro energy:</u>** **(i) All river-sites are not suitable for construction of dams.** **(ii) Large ecosystems are destroyed when submerged under the water in dam.**
61	What is biogas? How can biogas be obtained? Why is the use of biogas obtained from cow-dung advised in preference to burning of cow-dung cakes? Or Why is biogas a better fuel than animal dung cakes? Ans: **Biogas is a mixture of four gases namely methane, carbon dioxide, hydrogen and hydrogen sulphide.** **Biogas is obtained from anaerobic decomposition of cow dung and plants and animal wastes in a biogas plants.** **This is because, biogas does not produce smoke during burning and hence there is no air pollution. On the other hand, burning of animal dung cakes causes air pollution. Moreover, biogas gives more heat energy than the burning of animal dung cakes**.

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62	What are the environmental consequences of the increasing demand for energy? What steps would you suggest to reduce energy consumption? Ans: • **Industrialization increases the demand for energy. Fossil fuels are easily accessible sources of energy that fulfil this demand.** • **The increased use of fossil fuels has a harsh effect on the environment. Too much exploitation of fossil fuels increases the level of greenhouse gas content in the atmosphere, resulting in global warming and a rise in the sea level.** • **It is not possible to completely reduce the consumption of fossil fuels. However, some measures can be taken such as using electrical appliances wisely and not wasting electricity.** • **Unnecessary usage of water should be avoided. Public transport system with mass transit must be adopted on a large scale. These small steps may help in reducing the consumption of natural resources and conserving them.**

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13. OUR ENVIRONMENT

Multiple choice questions

1. Which of the following groups contain only biodegradable items?
(a) Grass, flowers and leather
(b) Grass, wood and plastic
(c) Fruit-peels, cake and lime-juice
(d) Cake, wood and grass
► **(c) Fruit-peels, cake and lime-juice**
(d) Cake, wood and grass

2. Which of the following are environment-friendly practices?
(a) Carrying cloth-bags to put purchases in while shopping
(b) Switching off unnecessary lights and fans
(c) Walking to school instead of getting your mother to drop you on her scooter
(d) All of the above
Ans: (d) All of the above

3. Which of the following is a biodegradable substance?
I. Glass
II. Plants
III. Plastics
IV. Polythene
Ans: **II. Plants**

4. Which of the following is a non-biodegradable substance?
I. Virgin plastic
II. Plastic
III. Plants
IV. Plant producers
Ans: **II. Plastic**

5. _____ is not a biodegradable pollutant.
I. Paper
II. Cotton cloth
III. Cotton
IV. DDT
Ans: IV. DDT

6. The formula of Ozone is _____
I. O_3

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II. O_2
III. O_4
IV. O_6

Ans: **I. O_3**

7. The number of atoms of oxygen present in ozone are

I. 3
II. 2
III. 5
IV. 6

Ans: I. 3

Short answer questions

1. Why are some substances biodegradable and some non-biodegradable?

Answer

- Substances are classified as biodegradable and non-biodegradable because some substances can be decomposed by microorganisms and some cannot.
- Substances that are broken down into simple soluble forms are called biodegradable substances and the substances that are not decomposed by microorganisms into harmless substances are called non-biodegradable substances.

2. Give any two ways in which biodegradable substances would affect the environment.

Answer

Biodegradable substances affect the environment by:

→ The biodegradable substances such as tree leaves, plant parts, and kitchen wastes can be used as humus after composting. This will enhance the soil fertility.

→ The biodegradable substances mainly contain carbon. These substances after decomposition release that carbon back into the atmosphere.

3. Give any two ways in which non-biodegradable substances would affect the environment.

Answer

Non-biodegradable substances affect the environment by:

→ They contaminate soil and water resources as they cannot be decomposed by micro-organisms.

→ These substances, when accidentally eaten by stray animals, can harm them and can even cause their death

4. What is the role of decomposers in the ecosystem?

Answer

Various role played by decomposers in the ecosystem are:

→ They clean the environment.

→ They decompose biodegradable substances into useful substances.

→ They release nutrients into soil by decomposing dead and decaying matter, thus making the soil fertile.

→ They maintain the nutrient pool by returning back the nutrients in the pool.

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5. What is ozone and how does it affect any ecosystem?

Answer

Ozone (O3) is a molecule, made up of three atoms of oxygen.

Ozone (O3) forms a layer in the upper atmosphere. It is very essential for the life on this planet. It shields the surface of the earth from ultra-violet radiation (UV) coming from sun as these radiations are very harmful causing skin cancer and cataract in humans. It also does harm to the crops.

6. How can you help in reducing the problem of waste disposal? Give any two methods.

Answer

We can help in reducing the problem of waste disposal by these methods:

→ By separating biodegradable substances from non-biodegradable substances.

→ By reducing, reusing and recycling non-biodegradable substances.

7. What are the problems caused by the non-biodegradable wastes that we generate?

Answer

The problems caused by non-biodegradable wastes are:

→ The cause biomagnification.

→ They increase pollution.

→ They make environment unclean.

→ They kill useful microorganisms.

8. If all the waste we generate is biodegradable, will this have no impact on the environment?

Answer

If all the waste generated would be biodegradable this will also create problem. As the numbers of decomposers will be quite low so wastes cannot be broken down into harmless simpler substance at right time. It will became breeding ground for flies causing spread of diseases. It will also emits foul smell which makes the life of people miserable.

9. Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?

Answer

The damage to the ozone layer a cause for concern because:

→ It causes skin darkening, skin cancer, ageing, and corneal cataracts in human beings.

→ It can result in the death of many phytoplanktons that leads to increased global warming.

To limit the damage to the ozone layer, the release of CFCs into the atmosphere must be reduced. CFCs used as refrigerants and in fire extinguishers should be replaced with environmentally-safe alternatives. Also, the release of CFCs through industrial activities should be controlled.

10. Write the cause for depletion of ozonelayer . Write itseffectand measure tosave it.

Answer

.Delpetionofozone layeriscaused by CFC(chlorofloro carbon)Effects:-Cancerin human beings,Lossofimmunityinhumans,Destructionofaquaticlifeandvegetation.

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Step takentolimit thedamagetothe ozone layer:- reducingthe useofCFCs

11. Distinguish between biodegradable and non-biodegradable substances.

Answer

Biodegradable substances	Non-biodegradable substances
1.Decomposed by microorganisms	1.Not decomposed by micro-organisms.
2.Donot cause biomagnification	2.Cause biomagnification.
Ex:Kitchenwastes,paper,sewage.	Ex:Plastic,metalcans, glass, polymers

12.List eco-friendlyhabits.

Answer

i) Usingpaperbagsinstead of plasticbags,
ii) ii)Usingpublic transportation system,
iii) iii)planting the trees,
iv) iv)properdisposal ofwasteproducts.

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14. SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Choose the correct answers.

1.Ancient water harvesting system of Karnataka is ----------

a) Khadin b) nadis c) kulhs d) kattas

Ans d) kattas

2.Large scale deforestation decrease

a) soil erosion b) rainfall c) Draught d) Global warming.

Ans b) Rainfall.

3.Now a days government has banned the use of polythene bags and is initiating to use paper bags because,

a) It is costly b) It is biodegradable c) It is non biodegradable d) It is lighter.

Ans b) it is biodegradable.

4.Bandharas and tals are the ancient water harvesting methods in

a) Madhya Pradesh b) Maharashtra c) Karnataka d) Kerala.

Ans b) Maharashtra.

5 The chipkomovement started from

a) Reni in Garhwal b) Arabari forest c) khejrali village d) village of Mandal.

Ans a) Reni in Garhwal.

6. By constructing khadin check dams in level terrains,

a) underground water level decreases

b) underground water level increases

c) vegetation in the nearby areas are destroyed due to excess moisture.

d) underground water gets polluted.

Ansb) underground water level increases.

7. The scientific method to conserve soil and water is-----

a) Construction of dams b) Watershed management

c) Rainwater harvesting d) Afforestation

Ans b) Watershed management.

8. Sustainable management should be become mandatory as

a) Natural resources are limited

b) Natural resources lasts for a longer period

c) Future generation may not enjoy the benefits of natural resources

d) all the above.

Ans d) All the above.

9. Earthen pot with cracks can be used to grow plants. This is based on this 5R principle

a) Refuse b) Re use c) Re purpose d) Re cycling

Ansd) Re purpose

10. Bishnois community sacrificed their life for the protection of-------

a) Teak trees b) Sal forest c) khejri trees d) Sandalwood trees.

Ans c) Khejri trees.

11. A woman who fought for the protection of khejri trees.

a) Medhapatkar b) Amrita Devi Bishnoi.

C)SaalumaradaThimmakka. d) DurgaBanerjee .

Ans b) Amrita Devi Bishnoi

One mark question and answers.

1. What does the high level of total coli form count in river Ganga indicate?

Ans.- It indicates that water is contaminated by disease causing microorganisms.

2.Write the main objective of conservation of biodiversity.

Ans – one of the main objective of conservation of biodiversity is to preserve the biodiversity we have inherited and to maintain ecological balance.

3.What is rainwater harvesting?

Ans – Water harvesting is the activity of direct collection of rain water, which can be stored for direct use or can be used to recharge the groundwater.

4.State the meaning of ' Sustainable development'.

Ans – Sustainable development means to encourage forms of growth that meet current basic human needs , while preserving the resources for the needs of future generation.

5.Which is the hot spot of biodiversity?.

Ans – Forests are biodiversity hotspots.

6.Forests are Biodiversity Hotspots . justify this statement.

Ans – because a wide range of species are found their. The range of different life forms includes bacteria, fungi, flowering plants, nematodes, insects, reptiles, mammals,etc.

7. Mention the two conservative methods for the ground water.

Ans – Crescent shaped earthen embankments

Low, straight concrete and rubble check dams.

8.Write the 5 R's to save the environment.

Ans - The five R's to save the environment are Refuse, Reduce, Reuse, Repurpose, and Recycle.

TWO MARK QUESTIONS.

1. Suggest some approaches towards the conservation of forest?

Ans – Conservation of forests some approaches are

- Afforestation and reforestation .
- Laws can be made for conservation of forests.
- Controlled grazing
- Checking on fire and cutting of trees.
- Building of national parks, sanctuaries and biosphere reserves.

2 . With the help of an example, show that reuse strategy is better than recycling.

Ans - i) Recycling uses some energy while reuse do not require energy.
ii)Only segregated wastes can be recycled.
Iii) Recycling also causes pollution.
For example, reuse of old plastic bottles/plates is far better than recycling them which requires chemicals and cause water and air pollution.

3 . Write two disadvantages of planting only one type of trees in forests.

Ans – i) For planting only one type of trees in forests , huge areas are cleared of all vegetation. This will destroy a large amount of biodiversity in the area.
ii) Local people will not be able to fulfil their need such as herbs for medicines, fruits and nuts for food and leaves for fodder ,as they get from a natural forest

4 . What are the advantages of storing water in the ground?.

Ans - Water does not evaporate when stored underground.

- Water can be spread to recharge wells.
- It also provides moisture for the vegetation to survive during dry periods.
- As the water is not stagnant, it cannot become breeding ground for mosquitoes.
- Ground water is also protected from contamination by humans and animals wastes.

5 What changes can you make in your habits to become more eco –friendly?

- Stop wastage of water
- Switching off unnecessary lights and fans.
- Don’t waste food.
- Walking down or use cycle for going to nearby market instead of using vehicle
- Separate wastes into recyclable and non recyclable.
- Reuse carry bags, packing materials, plastic containers and other reusable material.

6. Natural resources should be used cautiously why? Explain.

Ans – Because the resources are limited and with the human population increasing at a tremendous rate due to improvement in health –care , the demand for all resources is increasing at an exponential rate.

7. For what purpose National award is given on the memory of Amrutha Devi Bishony?

Ans – The Government of India has recently instituted an 'Amrita Devi Bishoni National Award for Wildlife Conservation ' in the memory of Amrita Devi Bishoni, who in 1731 sacrificed her life along with 363 others for the protection ,of Khejri trees in khejarli village near Jodhpur in Rajasthan.

8. List four stakeholders which may be helpful in the conservation of forests.

- The people who live in or around forests are dependent on forest products.
- The forest department of the Government which owns the land and controles the resources from forests.
- The industrialists
- The wildlife and nature enthusiasts.

9. Why should we conserve forests and wildlife?

Ans – We should conserve forests and wildlife because

- They maintain biodiversity.
- They are essential for ecological balance.
- Forests prevent flood and also influence rainfall.
- They provide us many life saving drugs, silk, lac, honey, timber,etc.

10 .What are the problems faced by construction of large dams?

Ans – i) Social problems- because they displace large number of peasants and tribals without adequate compensation or rehabilitation.

ii) Economic problems- because they swallow up huge amounts of public money without the generation of proportionate benefits,

iii) Environmental problems – because they contribute enormously to deforestation and the loss of biological diversity.

THREE AND FOURE MARKS QUESTIONS.

1. How our holy river Ganga is getting polluted? What is its ill effect? What is being done to prevent its pollution?

   Ans – Ganga is getting polluted due to sewage, harmful chemical and immersing of human corpses thrown into the river untreated. The bathing , washing, also cause its pollution. The industries contribute their chemical effluents to the Ganga's pollution load.

   The pollution makes water toxic which is very harmful for health.

   Ganga Action plan (1985) was started to prevent its pollution.

2. What was 'Chipko Andolan'? How did this Andolan ultimately benefitted the local people and environment?.

Ans – Chipko Andolan was a non –violent movement that aimed at conservation of forests from being destroyed. People used to protect trees so that they prevent them from being cut down.

The Chipko Andolan benefitted the local population as ;

- The local people could continue depending on the forests for fulfilling their basic needs.
- It forced the government to rethink their priorites in the use of forest produce and include the local people in forest management

3. Mention the steps taken by West Bengal Government to protect badly degraded Sal forests.

Ans – Steps taken by the West Bengal Government to protect Arbari Sal forest range of Midnapore district, especially by forest officer A K .Banerjee are;

- Involvement of villagers in the protection of Sal forest.
- For help in protection of Sal forests, villagers were given employment in both silviculyure and harvesting operations 25% of the final harvest.
- They were also allowed fuelwood and fodder collection on payment of a nominal fee.

  With the active and willing participation of the local community, the Sal forests of Arabari underwent a remarkable recovery.

4. The construction of large dams leads to social and environmental problems. List two problems of each category.

Ans – Social problems arise because the construction of dams causes the displacement of a large number of tribals and peasants who are then renderd homeless. They are neither given sufficient compensation or rehabilitation nor do they get any benefits from these projects.

Construction of dams leads to several environmental problems such as deforestation and loss of biodiversity because large areas of forest land get submerged in water leading to an ecological imbalance.

5. 'Narmada Bachao Andolan' rasied issues of how dams create problems. Discuss.

Ans – Narmada Bachao Andolan (Save the Narmada Movement) about raising the height of the Sardar Sarovar Dam on the river Narmada raised three problems in particular.

i) Social problems- because they displace large number of peasants and tribals without adequate compensation or rehabilitation.

ii) Economic problems- because they swallow up huge amounts of public money without the generation of proportionate benefits,

iii) Environmental problems – because they contribute enormously to deforestation and the loss of biological diversity.

6. What are 5R practices which protects environment. Explain briefly.

- Refuse – Refuse to buy products that can harm you and the environment.
  Say no to single use plastic carry bags.
- Reduce-This means that you use lee. You save electricity by switching off unnecessary lights and fans. You can save water by repairing leaky taps, do not waste food.

- Reuse -This is actually even better than recycling because the process of recycling uses some energy you simply use things again and again . Instead of throwing away used envelops, you can reverse it and use it again.

  The plastic bottles in which you buy various food items like jam and pickle can be used for storing things in the kitchen.

  - Repurpose – this means when a product can no more be used for the original purpose, think carefully and use it for some other useful purpose. For eg; Cups with broken handles can be used to grow small plants and as feeding vessels for birds,
  - Recycle- This means that you collect plastic paper, glass and metal items and recycle these materials to make required things.

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