Science

STUDENT'S NAME..T.C. Avani.....
CLASS..Xth std.....SUBJECT.....Science.....
ROLL No.....DATE [ ][ ][ ] 2 0 [ ]

General Science – Model paper - 2

PART A

PHYSICS

I Multiple choice questions:

1. The source of energy in nuclear power reactor is,
   a) Nuclear fission reaction.
   b) Exothermic chemical reaction.
   c) Nuclear fusion reaction
   d) Controlled nuclear fission chain reaction.

2. Which of the following is NOT a property of magnetic lines?
   a) Magnetic field lines are dense near poles.
   b) Magnetic field lines are closed loops
   c) Magnetic field lines intersect each other.
   d) Magnetic field lines emerge from north pole & merge at the south pole

3. The work done in moving a charge of 2C across two points having a potential difference 12 V is,
   a) 24 J b) 6 J c) 14 J d) 10 J.

4. The correct way of using electrical appliances in domestic electric circuit.
   a) connecting electrical appliances in series.
   b) using an electrical appliance of 880 W power in 5A electric circuit
   c) connecting main fuse to electrical appliances in parallel
   d) using an electrical appliance of 2 KW power in 5A electric circuit

II Answer the following:

5. State Fleming's left hand rule.

=> "When a current-carrying conductor is placed in an external magnetic field, the conductor experiences a force perpendicular to both the field and to the direction of the current flow".

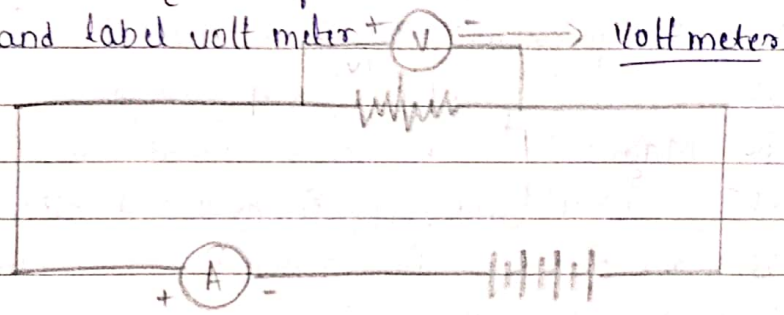
6. Name the lens that always produces erect, diminished and virtual image.

=> Concave lens.

(III) Answer the following questions:

7. Draw the diagram of the electric circuit used to study Ohm's law and label volt meter

=>



8. "Bio-mass is a renewable source of Energy" Justify this statement with suitable reason.

=> Biomass is considered as renewable energy source because its inherent energy moves from the sun and because it can regrow in a relatively short time.

Trees take in CO_2 from the atmosphere and convert it into biomass and when they die, it is released back into the atmosphere.

(IV) Answer the following questions:

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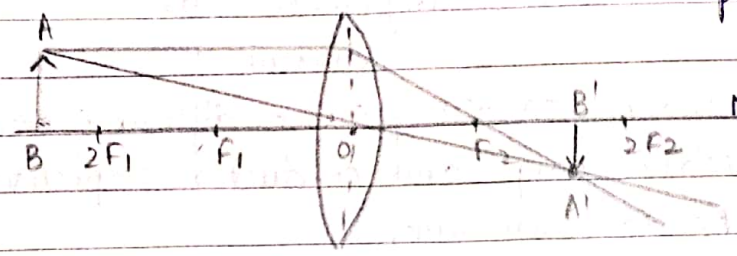
9. Draw a ray diagram to show the formation of image by a convex lens when the object is placed beyond $2F_1$. Mention the position & Nature of the image.

=> position = b/w F_2 & $2F_2$ of image

Nature = Real / inverted



10. What is electric current? Mention the use of battery in an electric circuit. Write the factors on which the resistance of a conductor depends.

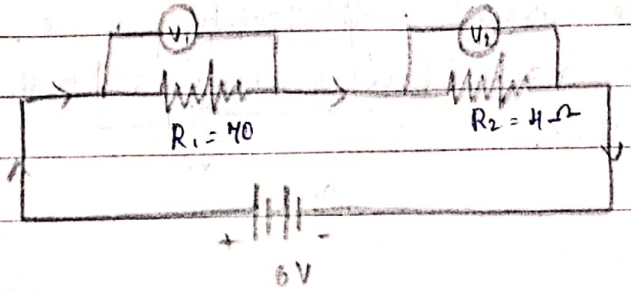
=> Electric current: The rate of flow of charge is called current.

A battery is a source of energy which provides a conversion of stored chemical energy into electrical energy.

Resistance of a conductor depends on;

i) directly proportional to the length of conductor
ii) inversely proportional to the area of cross-section.
iii) directly proportional to the temperature and
iv) depends on nature of material.

11. An electric lamp whose resistance is 20 Ω and a conductor of 4 Ω resistance are connected in series to a 6V battery. Find the current through the circuit and the potential difference across the electrical lamp and conductor.



Given:

Electric lamp (R_1) = $20\,\Omega$
Conductor (R_2) = $4\,\Omega$
potential difference = 6V
Current = ?

V_1 and V_2 are the potential difference ~~occarross~~ across the electrical lamp and conductor respectively.

Acc to ohm's law,

$$V = IR$$

$$6 = IR \longrightarrow (1)$$

$$R_s = R_1 + R_2$$

$$R_s = 20 + 4$$

$$\boxed{R_s = 24\,\Omega}$$

Substituting in eq (1);

$$6 = IR$$

$$6 = I \times 24$$

$$\frac{6}{24} = I$$

$$\boxed{I = 1/4} \Rightarrow \boxed{I = 0.25\,A}$$

V_1 across electric lamp,

$$V_1 = IR_1$$

$$V_1 = (0.25)(20)$$

$$\boxed{V_1 = 5\ Volt}$$

V_2 across Conductor,

$$V_2 = IR_2$$

$$V_2 = (0.25)(4)$$

$$\boxed{V_2 = 1\ Volt}$$

∴ The current in the circuit is 0.25 A potential difference across Electric lamp is 5 Volt and conductor is 1 Volt.

Or

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A copper wire has diameter 0.5mm and resistivity of $1.6 \times 10^{-8}\ \Omega m$. What should be the length of this wire to make its resistance 10Ω.

$\Rightarrow$ diameter = 0.5mm

$= 0.5 \times 10^{-3}\ m$

$= 5 \times 10^{-4}\ m$

Radius (r) = $\frac{\text{diameter}}{2}$

$= \frac{5 \times 10^{-4} m}{2}$

$= 2.5 \times 10^{-4}\ m$

Resistivity = $\rho = 1.6 \times 10^{-8}\ \Omega m$

Resistance = 10Ω

Wkt, $R = \rho \frac{l}{A}$

$l = R\left(\frac{A}{\rho}\right)$

area of cross section A,

$A = \pi r^2$

$A = \frac{22}{7} \times (2.5 \times 10^{-4})^2$

$A = \frac{22}{7} \times (2.5)^2 \times (10^{-4})^2$

$A = \frac{22}{7} \times 6.25 \times 10^{-8}$

$A = \frac{22}{7} \times \frac{625}{100} \times 10^{-8}$

$A = \frac{13750}{7} \times 10^{-10}$

$A = 1964.28 \times 10^{-10}\ m^2$

$A = 1.964 \times 10^{-7}\ m^2$

$$d = R\left(\frac{A}{P}\right)$$

$$d = \frac{10 \times 1.964 \times 10^{-7}}{1.6 \times 10^{-8}}$$

$$d = \frac{10 \times 1.964 \times 10^{-7}}{1.6 \times 10^{-8}} \times \frac{10}{1000}$$

$$d = \frac{1964 \times 10^{-7}}{16 \times 10^{-8}} \times \frac{100}{1000}$$

$$d = \frac{491}{4} \times 10^{-7-(-8)} \times \frac{1}{10}$$

$$d = \frac{122.7 \times 10^{-7+8}}{10}$$

$$d = \frac{122.7 \times 10}{10}$$

$$\boxed{d = 122.7\,m}$$

V Answer the following questions:

12. State the law of reflection of light difractive media have different refraction index. Why? The refractive index ~~speed length~~ f = ~~[illegible]~~ of glass is 1.5. What is the ~~[illegible]~~ meaning of this statement?

=> The laws of refraction are:

i) The incident ray, refracted ray and the normal all lie on the same plane.

ii) The ratio of sine of angle of incidence to the ~~signe~~ of angle of refraction is ~~[illegible]~~ constant to the interface to any two medium.

The speed of light travels 1.5 times slower in that glass than in a vaccuum.

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(VI) Answer the following questions:

13. Explain Faraday's experiment of magnet and coil. What factors can be observed with the magnet replaced by a coil carrying current? What are the conclusions that can be drawn by you from these experiments? State electromagnets induction with the help of this experiments.

=> Faraday's experiment of magnet and current are a bar magnet was pushed towards the coil. The same effect is observed when instead of the bar magnet, the coil is moved out and the magnet is held stationary.

The factors can be observed with the magnet are,

* Magnetic field increases as the current through wire increases.
* Magnetic field decreases as the distance from the wire increases.

The electromagnetic Induction is the phenomena of generation of electric current by causing a variation in the magnetic field is electromagnetic induction. Faraday conduct on experiment in which a coil connected to a galvanometer is placed near a bar magnet.

PART - B

CHEMISTRY

VI Multiple choice questions :

14 The name of carbon compound $H-\overset{H}{\overset{|}{C}}=O$ is,

a) Methanal b) Methanone

c) Ethanal d) Methanoic ore

15. Observing 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

VII Answer the following questions :

16. What is a strong acid?

=> A strong acid is one which is virtually 100% ionised in solution acid. Concentration of H^+ ions.

17. State modern periodic law.

=> The Modern periodic law states, " The chemical and physical properties of elements are a periodic functions of their atomic numbers

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

=> Metallic character increases as you move down the electrons become easier to lose as the atomic radius

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increases.

19. What is Substitution Reaction?

=> Substitution Reaction is also known as a single displacement reaction. It is a chemical reaction during which one functional group is replace by another functional group.

(VIII) Answer the following questions:

20. The compound C_2H_4, C_3H_6, C_4H_8, C_5H_{10} are in homogeneous series. Why? write the general name and general formula for these carbon compounds.

=> A series of organic compounds each containing a characteristics functional group and the successive member differ from each other.

C_2H_4 → Ethylene or Ethene
C_3H_6 → propene
C_4H_8 → Buetene
C_5H_{10} → pentene.

21. The atomic number of an Element is 20. In which 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?

=> The element having atomic number 20 is, placed in the group 2 and 4th period of the periodic table.
The element is Calcium.
The metals are to the left to the line and Non-metals are to the right of the line. The elements immediately adjacent to the line are the metalloids

22. Why is a metal oxide called as basic oxide ?
Name the products obtained when copper oxide reacts with dilute hydrochloric acid.

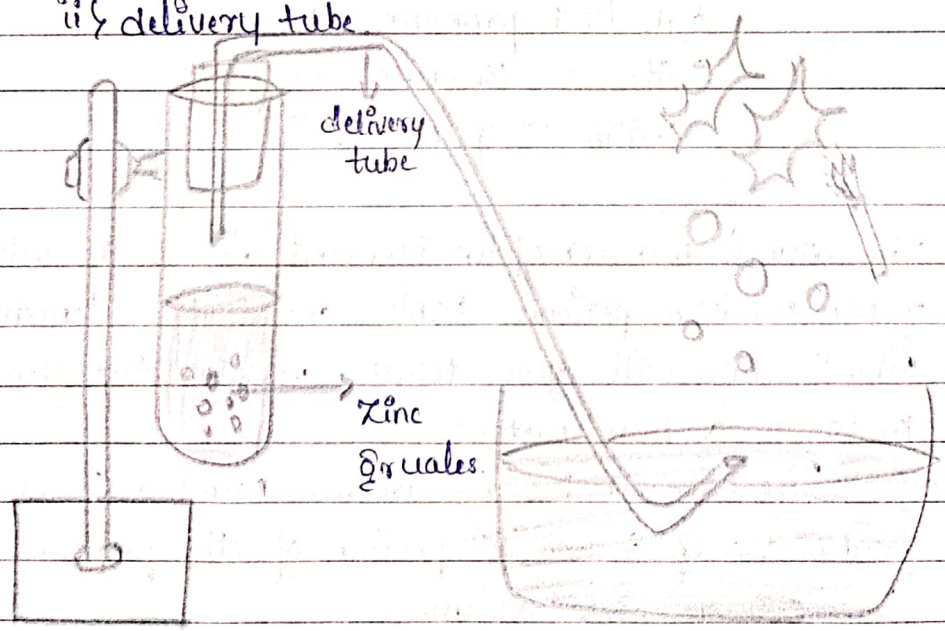
⇒ * Metallic oxides are basic in nature because they react with dilute acids to form salt and water.

* $CuO + HCl \longrightarrow CuCl_2 + H_2O$

Copper oxides dissolves in mineral acids such as hydrochloric acid, Sulphuric acid or nitric acid to give the corresponding copper salts.

IX Answer the following questions:

23. Draw the diagram of the arrangements of the apparatus showing the reaction of zinc granules with dilute Sulphuric acid and testing hydrogen gas by burning.
i) Zinc granules
ii) delivery tube



Reaction of Zinc granules with H_2SO_4.

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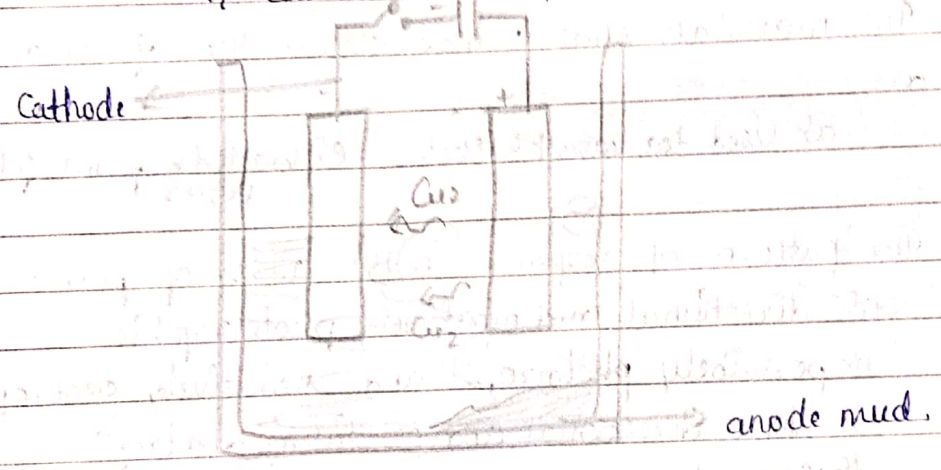
24. Explain the cleaning actions of soaps.

=> * Most of the dirty is oily in nature and oil doesn't dissolve in water. Its hydrophobic ends of the molecule of soap constitutents sodium or potassium salts of long chain carboxylic acids.

* In the case of soaps, the carbon chain dissolves in oil and the ionic end dissolves in water.

25. Draw the diagram of apparatus used in the electrolytic refining of copper. lable the following.
i) Cathode ii) Anode mud.

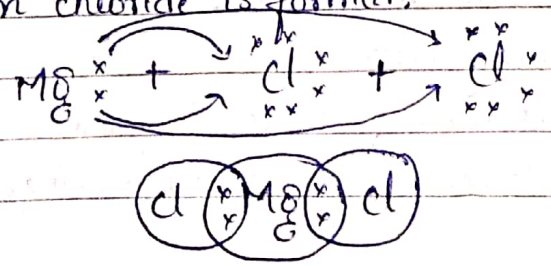
=>



Q Answer the following questions:

26. a) Explain the formation of ionic compounds magnesium chloride with the help of electron dot structure.

=> Magnesium reacts with chlorine by losing two electrons and on the other hand chlorine reacts by gaining the electrons lost by magnesium. In this a reaction takes place and others thus a compound known as Magnesium chloride is formed.



b) Write the chemical balanced equation for the reaction of a aluminium metal with steam.

⇒ The balanced chemical equation of reaction of hot alluminium with steam.

$$2Al + 3H_2O \Rightarrow Al_2O_3 + 3H_2$$

PART C

BIOLOGY

(xi) Multiple choice questions:

27. The materials that change slowly their form and nature are

a) Used tea leaves b) Peels ~~c)~~ Wasted paper c) plants fibers

28. The pattern of response in the roots of plants is.

~~a)~~ directional and negatively phototrophic

b) positively phototropic and negatively geotropic

c) Non-directional and positively geotropic

d) Growth dependent and positively hydrotropic

(xii) Answer the following questions:

29. Mention the reason for the depletion of ozone layer.

⇒ Ozone depletion occurs when chlorofluorocarbon gases formely found in spray and refregenerators are released into the atmosphere.

30. Name any two ancient system that were practiced to harvest rain water.

⇒
- Collection of water in ponds
- Construction of small earthern plans

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XIII Answer the following questions:

31. How is oxygen rich blood iron the lens supplied than all the cells in the human body?

=> The right ventricles pumps the blood from the right atrium into the lungs to rich oxygen and remove Co_2 the left atrium recieves blood from the lungs, this blood is rich in oxygen. The left ventricle pumps the that blood from the left atrium for the blood supply all organs with oxygen rich blood.

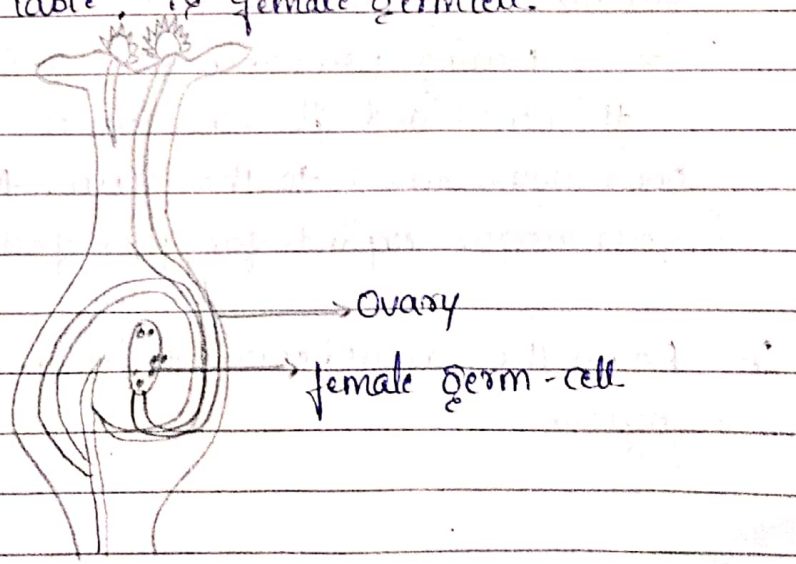
32. The people who live in around the forests are said to be the stakeholders of the forests. Why? Explain.

=> People who live in and around the forests are said to be the stakeholders because,

* They are dependent on forest produce.
* They cruelly cut the branches of the tree in pluch their leaves, but don't cut down the whole tree.
* They also collect green fadden and graze their cattle in the forest.

33. Draw the diagram showing the germination of pollen or stigma and lable, if female germcell.

=>



(XIV) Answer the following questions:

34. How do genes control and expression of tall or sheet traits in plants?

=> Consider tallen as a characterstics of plant height depends upon particular plant hormone which is turn will depend on the efficiency of the process for making it if the enzyme responsible for the production of their hormone is efficient, plant will be tall if the gene for that makes enzyme has an alteration that make enzymes less efficient on that makes enzyme less effects the amount of hormones will be less and plants will be short.

35. In female reproductive system,

i) How does an egg from the ovary each uterus and develops into foetus?

=> A pregnancy starts with fertilisation when a women egg joins with man sperm, fertilisation finally occurs in fallopian tube that links on ovary and uterus. If the fertilised egg travels down the fallopian tube and came to uterus and embryo starts growing.

ii) What are the changes that occur in the uterus for the development of the foetus?

=> During pregnancy, the lining of your uterus thickened and its blood vessels enlarge to provide good nourishment to the foetus. As pregnancy programes your uterus expands for your foetus.

36. Draw the labelled diagram showing the structure of nephron.

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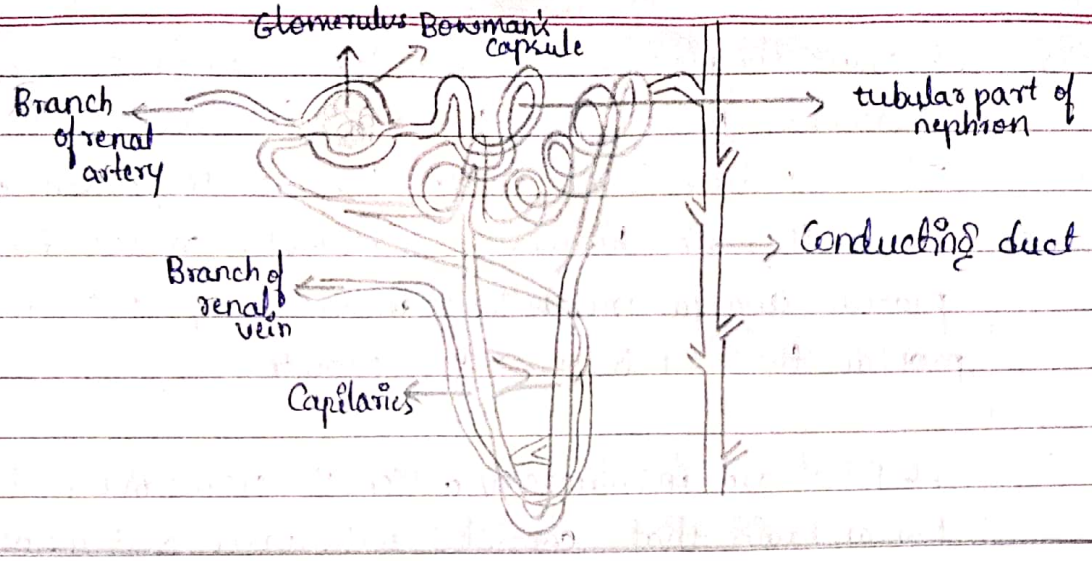
=>



(XII) Answer the following questions:

34. a) How do Homologous characterstics in different organisms helps to identify the evolutionary relationship.

=> Forelimbs of human and birds are homologous they have some structure design and developmental origion. But they have different functions and appearnce, homologous organs helps us to understion that the organism have evolved from common characterstics the two species have the more closely.

b) How do mendel's monohybrid cross Experiment clarify that, the traits of an organism independently inherit in the progins'?

=> Mendel crossed pea plants having round green seeds (RRyy) with pea plants having wrinkled yellow seeds (rrYY).

* The cross between two plants with single contrasting character is called mono-Hybrid cross.

38. a) Name the mineral required for the production of thyroxin hormones. What is the use of their hormone to our body?

⇒ Iodine is necessary for the thyroxin gland to make thyroxin hormone. It regulates carbohydrates protein and fat metaboilism in the body is so as they provide the best balance for growth.

b) What are involuntary actions? Name the parts of the human brain that controls voluntary and involuntary actions.

⇒ This is not under the control of the wil of an individual and automatic response to a stimulus which is not under the voluntary control of brain.

Medulla controls involuntary actions and

Cerebrum controls voluntary actions.