Science

STUDENT'S NAME	J.C. Avani.	TOTAL MARKS OBTAINED
CLASS xth std	SUBJECT Science.	
ROLL NO.	DATE	

SCORE+

General Science – Model paper – 1

PART A

PHYSICS

I Multiple Choice Questions:

1. The SI unit of electric charges is;
   a) Volt b) ampere c) coulomb d) joule

2. The suitable focal length of the convex lens used as magnifying lens to read "Hallmark 916" written on ornaments is;
   a) 12 cm b) 60 cm c) 100cm d) 120cm

3. The magnetic field lines inside solenoid are in the form of parallel straight lines. The reason for this is, the magnetic feild inside the solenoid is:
   a) Very high b) Uniform
   c) 0 d) produced by electricity

II Answer the following questions:

4. If the radius of curvature of a lens is 30cm, then what is its focal length?

=> R = 30cm (given)

$f = \frac{R}{2}$

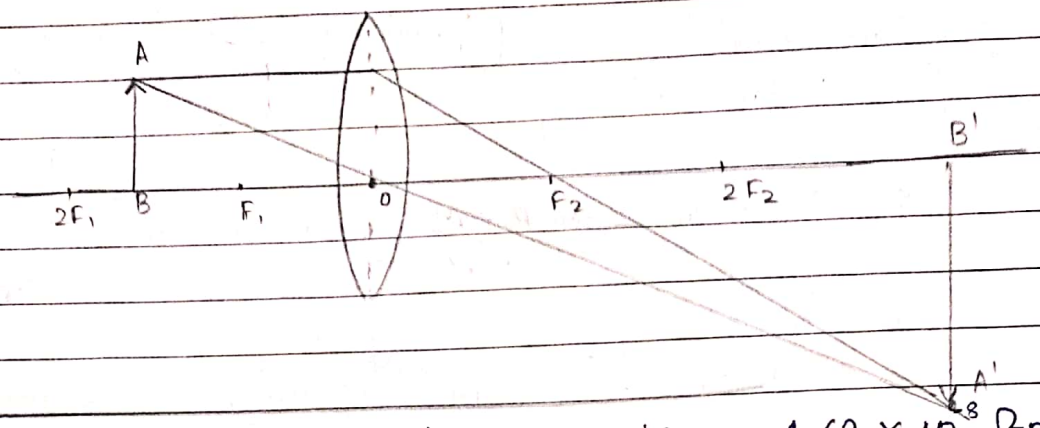
$f = \frac{30}{2} = 15 \Rightarrow f = 15$

5. In the experiment of refraction through a glass slab, the angle of incidence should be less than 90°. Why?

=> The angle of incidence should be less than 90°. Because if it exceeds 90° angle it causes total internal reflection instead of refraction.

Write.....right n score

6. Draw the ray diagram to show the formation of image by a convex lens when the object is kept between $2F_1$ and F_1. (F_1: principle focus of convex lens).



7. The resistivity of two conductors A and B are $1.62 \times 10^{-8}\ \Omega m$ and $5.20 \times 10^{-8}\ \Omega m$ respectively. Which of them is used in:

i) transportation of electricity.

⇒ Conductor A is used in transporting electricity.

ii) The making of heating coils. Why?

⇒ Conductor B is used in making of heating coils Because it has high resistivity and resistance to oxidation at high temperature.

8. Observe the following table. Complete the table using ohm's law:

Sl no.	Electric current (I)	Potential difference (V)	Resistance (R)
1.	2A	120 V	60 Ω
2.	1.5A	90V	60 Ω
3.	1A	60V	60 Ω

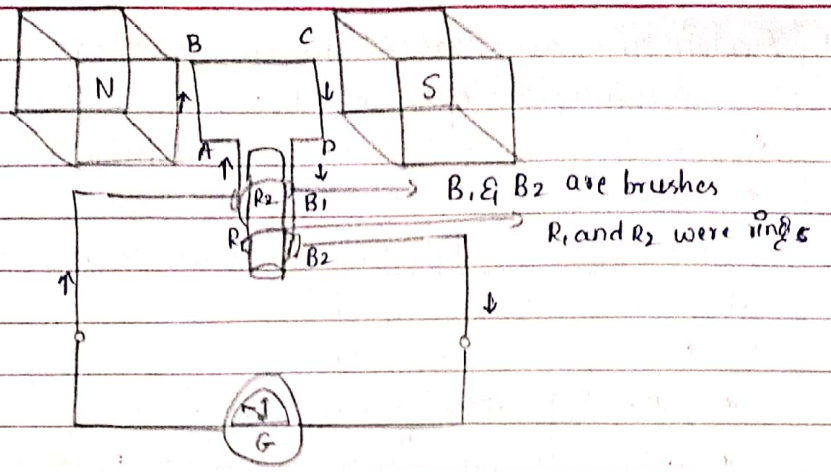
(IV) Answer the following questions:

9. Draw the diagram of an electric generator. lable the following parts. i) Carbon brushes
ii) Rings.

Write.....right n score

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+



10. Explain the experiment to find out the focal length of a convex lens. The focal length of a convex lens is 100cm. Find its power?

=> Given: Concave lens

$f = -15\,cm, \quad u = -30\,cm, \quad v = ?, \quad m = ?$

lens formula,

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{-15} = \frac{1}{v} - \frac{1}{-30}$$

$$\frac{1}{-15} = \frac{1}{v} + \frac{1}{30}$$

$$\frac{1}{-15} - \frac{1}{30} = \frac{1}{v}$$

$$\frac{30+15}{-450} = \frac{1}{v}$$

$$\frac{\cancel{45}^{1}}{-\cancel{450}_{10}} = \frac{1}{v}$$

$$\frac{1}{v} = \frac{1}{-10}$$

$$\therefore \boxed{v = -10\,cm}$$

$$m = \frac{v}{u} = \frac{-\cancel{10}^{1}}{-\cancel{30}_{3}}$$

$$\boxed{m = 1/3}$$

∴ The image distance is -10cm and magnification is 1/3.

Write.....right n score

11. Explain the advantages and disadvantages of solar cells.

=> Advantages of Solar cell:

* Eco-friendly and cause less pollution
* They have low maintanance cost.
* The source of Energy for solar cell is present in abundance.

Disadvantages of Solar cell:

* The cost of Manufacturing is very expensive.
* Solar cells have low efficiency. They can convert only about 25% of light energy falling on them into electricity.
* It can not be used in absence of light from any source.

V Answer the following questions :-

12. Explain the principle of working of simple electric motor. What is the role of split rings in an electric motor? How are commercial motors different from simple electric motor.

=> The principle of an electric motor is based on the current carrying conductor which produces magnetic field around it. A current carrying conductor is placed perpendicular to the magnetic field so that it experience a force. Split ring is used for reversing the direction of current in the coil.

difference b/w simple electric motors and commercial electric motors:

In commercial electric motors, field coils are used for producing magnetic field and not a permanent magnet as in the simple electric motors. These coils become magnetised when current passed through them.

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+

13. a) State Ohm's law. Mention the factors on which the resistance of a conductor depend.

=> Ohm's law: Potential difference across the two points of a metallic conductor is directly proportional to current passing through the circuit provided the temperature remains constant.

* factors on which the resistance of a conductor depends:

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.

b) State joule's law of heating and write the mathematical formula of this depend.

=> Joule's law of heating states that, " When a current (I) passes through a conductor of resistance 'r' for time 't' then the heat developed in the conductor is equal to the product of the square of the current and resistance and time.

$H = VIt$ $(V = IR)$

$H = IR \times It$

$\boxed{H = I^2Rt}$ $(H \propto I^2RT)$

Part B

CHEMISTRY:

(VI) Multiple choice questions:

14. The gas liberated when an acid reacts with a metal is

a) Hydrogen b) Chlorine

c) Carbon dioxide d) Nitrogen dioxide

Write.....right n score

15 The hydro carbon that undergoes addition reaction among the following is:

a) C_2H_6 b) C_3H_8 c) CH_4 d) C_3H_6

16. 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.

(VII) Answer the following questions:

17 Is it possible to test the hardness of water using detergents? Give reason for your answer.

=> Detergents are ammonium sulphonate salts of long chain carboxylic acids. Unlike soap, they do not react with calcium and magnesium ions present in hard or soft. This means that detergents can be used in both soft and hard water. Therefore, it cannot be used to check whether the water is hard or not.

18. 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?

=> Flourine, it has seven valency electrons, it only needs one more electron to acheive octate structure or noble gas configuration.

19. Ionic Compounds have high melting points. Why?

=> Ionic compounds have high melting point as it takes a lot of energy to overcome the strong electrostatic force of attraction between oppositely charged ions.

Write.....right n score

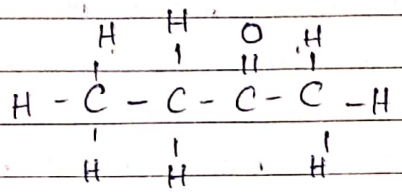
STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+

(VIII) Answer the following questions:

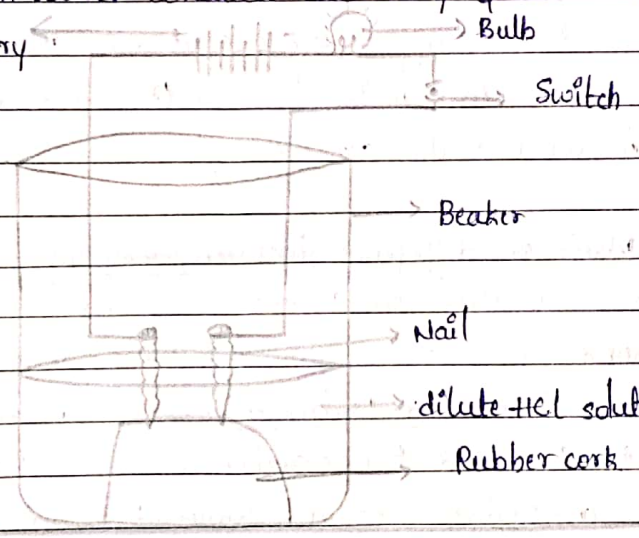
20. Name the ketone having four carbon atoms and write structure.

=> Butanone



21. Draw the diagram of the apparatus used to show that acid solution in water conducts electricity & lable dilute HCl.

=>



22. The gas liberated when sodium carbonate reacts with dilute hydrochloric acid is passed through lime water, a white precipitate is formed. But when the same gas is passed through lime water in excess, precipitate is not visible. Why?

=> Carbon dioxide gas is liberated when hydrochloric acid reacts with sodium hydrogen carbonate. The gas diberated thus will pass through lime water and lime water turns milky due to the presence of Carbon dioxide and further more if we do the same the solution becomes clear, because of the formation of Calcium hydrogen Carbonate.

(IX) Answer the following questions:

Write.....right n score

23. Explain the limitations of Mendleev's periodic table.

=> **limitations of Mendleev's Periodic Table:**

* Position of Hydrogen in the periodic table is uncertain
* Isotopes haven't been given separate place in periodic table.
* Increase in atomic mass was not regular while moving from one element to another.
* Mendleev didn't conform completely to the order of atomic mass.
* He swapped some elements around.
* Elements with large differences in properties were included in the same group.

24. Write one difference between saturated carbon compounds and unsaturated carbon compounds. Carbon forms covalent bonds with other atoms but not ionic bonds. Why? Explain.

=>

Saturated Hydrocarbons	Unsaturated Hydrocarbons
* Saturated hydrocarbons are carbonic organic compounds that have only carbon-Carbon single bond.	* Unsaturated Hydrocarbons are organic compounds containing at least one double bond or triple bond between Carbon atoms.
* Have only single bonds between carbon atoms.	* Have at least one double or triple bond between two Carbon atoms.
* less Reactive	* High Reactive.

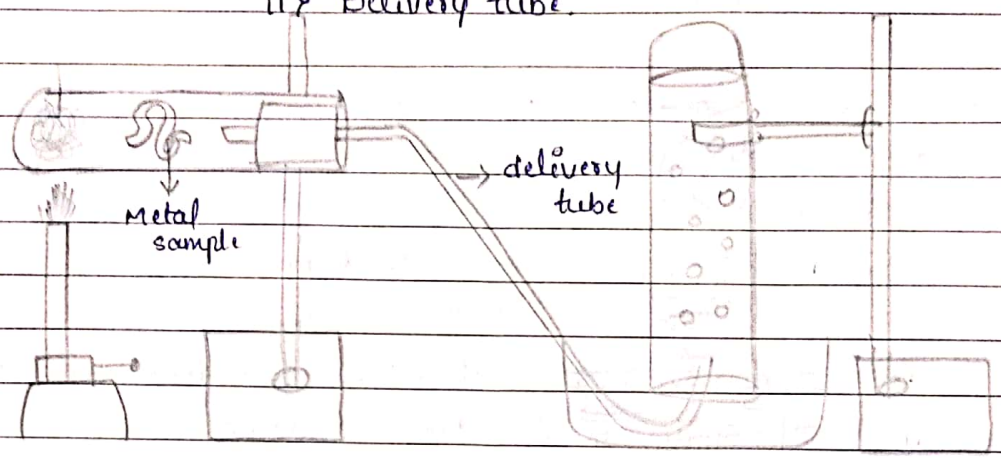
Carbon forms covalent bonds. Because Carbon has an atomic number 6 and have 4 electrons in its octate. So it can neither lose nor give 4 electrons to complete it's octate. So it forms covalent bonds by sharing it's four electrons and covalent bonds are more stronger than the ionic bonds.

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+

25. 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.

=>



Answer the following questions:

26. a) What are alloys? Name the alloy which has lead and tin as its constituent and write one of its uses.

=> The homologus mixture of two or more metals is called alloy.

Solder is an alloy of lead and tin. It is used for soldering of electrical wires, electronics, air conditioning, fire sprinkler etc

b) What is an amphoteric oxide? write any two chemical properties of metals.

=> Metal oxides which react with both acids as well as base to produce salts and water are known as Amphoteric oxides.

Chemical properties of Metals:

* Metals form an alloy with other metals or Non-metals.
* Some metals react with air and corrode.

Write.....right n score

Part C

BIOLOGY

(xi) Multiple choice questions:

27. The practice of using used materials without changing their shape and form is

a) Reuse b) Recycling
c) Repurpose d) Reduce

28. The correct statement with respect to biodegradable substances among the following is, these substances.

a) remain inert in the environment for a long time
b) harm various organisms in the ecosystem.
c) increase the density of harmful chemicals
d) undergo recycling naturally in the environment.

(xii) Answer the following:

29. How is ozone layer formed in the atmosphere?

=> Ozone is formed when heat and sunlight cause chemical reactions between oxides of nitrogen and volatile organic compounds which are known as Hydrocarbons. This reaction can occur both near the ground and high in the atmosphere.

30. Forests are called 'biodiversity hotspots', Why?

=> Forests are considered as 'biodiversity hotspots'. Because large number of life forms (such as bacteria, fungi, fern, nematodes, insects, birds, reptiles, mammales, gymnosperms and angeosperms) are found there. These are the regions with the biodiversity of endangered species, many of them being highly endemic

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+

31. Mention any 2 problems caused by the construction of dams.

=> Problem caused by the construction of huge dams are:

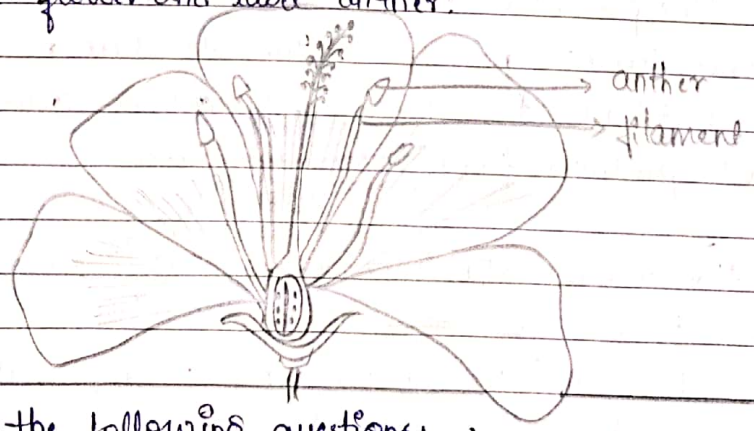
* They wipe out flora and fauna species.
* The habitation of the species in that particular region will be harmed and disturbed etc...

(XIII) Answer the following questions:

32. The tendrils of pea plant appear to move in a particular direction as they grow. How is this response called?

=> Pea plant climb up other plants or fences by means of tendrils. These tendrils are sensitive to touch. When they are come in contact with the any support, the part of the tendril in contact with the object. This causes the tendril to ~~create~~ circle around the object and thus clinge to it. Plants respond to stimuli slowly by growing in a particular direction.

33. Draw the diagram showing the longitudanal section of a typical flower and label 'anther'.



(XIV) Answer the following questions:

34. 'Having two sets of genes in the germ cells is not possible'. Clarify.

=> During sexual reproduction, the offspring cells are or organisms aquire the genetic information of their parents, during fertilisation, the male and female gametes

Write.....right n score

posses a haploid gamates of either parents and when they fuse, these characters present in the genome pass to the offsprings to form a diploid zygote. There are 22 chromosomes pairs (autosomes) and a pair of sex chromosomes (allosomes).

In case, if the sex cells were diploid cells then the number of chromosomes from generations to gerations would be doubled i.e, 23 pairs in the 1st generations, 46 pairs in the second generation and so on.

35. What is sexual maturation? How does menstruation occur? What is the function of placenta during pregnancy?

=> * It's a phase during which the reproductive organs develop at a slower rate. During sexual maturation, the changes that occur prepare the body to sexual reproduction.

* Monstruation occurs in female, when the egg produced inside the cervix is not fertilised. Since the egg does not fuse with male gamete, the uterus lining breakes down and bleeds causing menstruation.

* The placenta is an organ that develops in your uterus during pregnancy. This structure provides oxygen and nutrients to your growing baby and removes waste products from your baby's blood.

36. a) How are the studies of anatomical structure helpful for tracing evolutionary relationships?

=> Bidogist use several types of information to trace the evolutionary relationships between organisms.

* Anotomy and Embroyology:

Common anatomical features shared between organisms which would include ones that they are visible only during embroyonic development can indicate a shared evolutionary ancentry.

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
ROLL NO.	DATE	

SCORE+

b) How could we determine that 'the birds are closely related to reptiles

=> Birds are closely related to reptiles because both having the similar characterstics. Both birds and reptiles lays eggs, containing RBC, Both the birds and reptiles's breathing process is same that they breathe via lungs.

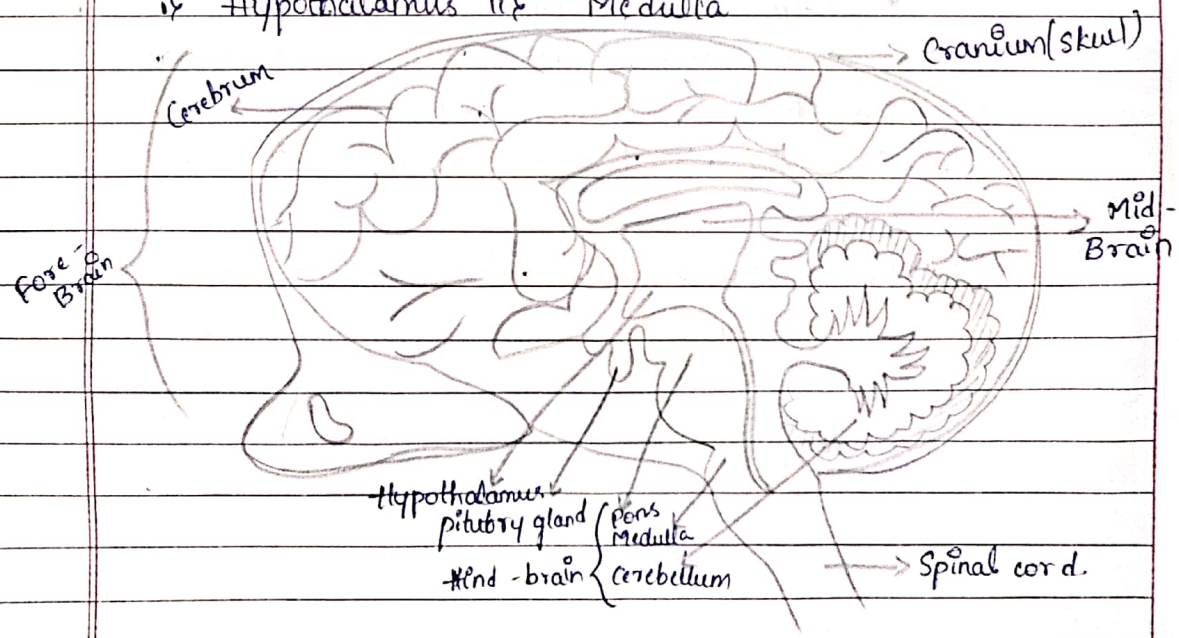
Reptiles have circulatory system as same like birds i.e. they have four chambered heart.

Hence anotomy of birds and reptiles are same.

(XV) Answer the following questions:

34. Draw the diagram showing the longitudinal section of the human brain. label the following parts.

i) Hypothalamus ii) Medulla



(XVI) Answer the following questions:

38. a) What are the functions of the fluids 'blood' and 'lymph' in humans? What are the different waste materials added to the urine from the blood?

=> Blood is a fluid conducting tissue. Blood consists of a fluid medium called plasma, in which the cells are suspended. Plasma transports food, carbon dioxide and nitrogenous wastes in dissolved form.

Lymph is fluid involved in transportation. Some amount of plasma, proteins and blood cells escape into the intercellular spaces in the tissues to form lymph or tissue fluid. Lymph is similar to blood plasma but colourless and contains less protein.

Nitrogenous wastes like urea and uric acid are removed from the blood in the kidneys.

b) How are waste materials excreted in plants?

=> Plants excrete their waste products in the following ways;

* Main waste products are CO_2, H_2O and O_2 in which water and gaseous waste products are released through stomata and lenticles.
* Many plants store wastes in the form of resins and gums.
* Plants also excrete some waste substances into the soil around them.