

Class-X
Science-086
SAMPLE QUESTION PAPER 2024

TIME: 3 Hrs.

M.M.:80

General Instructions:

- (i) The question paper comprises of five sections – A, B, C, D and E. You are to attempt all the sections.
- (ii) All questions are compulsory.
- (iii) Internal choice is given in sections B, C, D and E.
- (iv) Question numbers 1 and 2 in Section-A are one mark questions. They are to be answered in one word or in one sentence.
- (v) Question numbers 3 to 5 in Section- B are two marks questions. These are to be answered in about 30 words each.
- (vi) Question numbers 6 to 15 in Section-C are three marks questions. These are to be answered in about 50 words each.
- (vii) Question numbers 16 to 21 in Section-D are 5 marks questions. These are to be answered in about 70 words each.
- (viii) Question numbers 22 to 27 in Section- E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

SECTION A

1. Name a common nutrient that is absorbed in the small intestine and reabsorbed by the kidney tubules. 1
2. The presence of a particular group of bacteria in water bodies indicates contamination. Identify the group. 1

SECTION B

3. How is Magnesium Chloride formed by the transfer of electrons? Why does the solution of Magnesium chloride conduct electricity? 2
4. In a flowering plant, summarize the events that take place after fertilization. 2
5. A ray of light enters into benzene from air. If the refractive index of benzene is 1.50, by what percent does the speed of light reduce on entering the benzene? 2

OR

For the same angle of incidence in media A,B and C, the angles of refraction are 20° , 30° and 40° respectively. In which medium will the velocity of light be maximum? Give reason in support of your answer.

6. What happens when aqueous solutions of Sodium sulphate and Barium chloride are mixed? Give a balanced equation for the reaction with state symbols. Name and define the type of chemical reaction involved in the above change. 2

SECTION C

7. Identify the compound of calcium which is used for plastering of fractured bones. With the help of chemical equation show how is it prepared and what special precautions should be taken during the preparation of this compound. 3

OR

‘Sweet tooth may lead to tooth decay’. Explain why? What is the role of tooth paste in preventing cavities?

8. The electronic configuration of an element ‘X’ is 2,8,6. To which group and period of the modern periodic table does ‘X’ belong. State its valency and justify your answer in each case. 3

9. Pertaining to endocrine system, what will you interpret if- 3

- i) You observe swollen neck in people living in the hills
- ii) Over secretion of Growth Hormone takes place during childhood
- iii) Facial hair develops in boys aged 13.

10. A variegated leaf with green and yellow patches is used for an experiment to prove that chlorophyll is required for photosynthesis. Before the experiment the green portions (A), and the pale yellow portions (B), are observed. What will be the colour of ‘A’ just before and after the starch test? Also write the equation of photosynthesis and mark, as well as validate from which molecule the by-product is obtained. 3

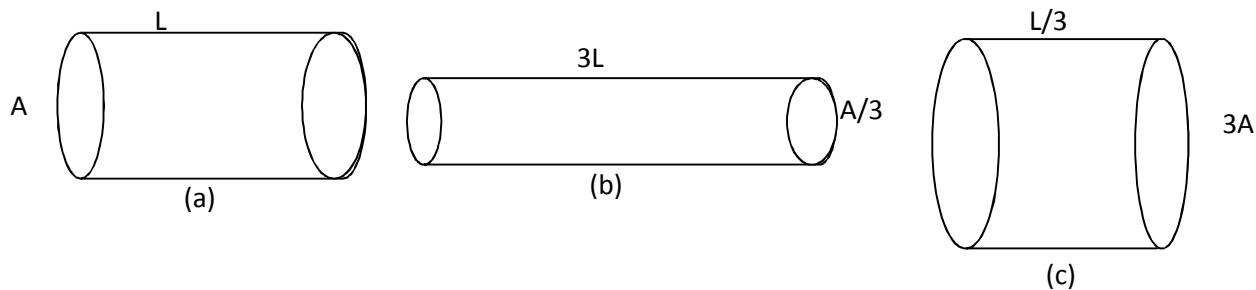
11. The image of an object formed by a mirror is real, inverted and is of magnification -1. If the image is at the distance of 30 cm from the mirror, where is the object placed? Find the position of the image if the object is now moved 20 cm towards the mirror. What is the nature of the image obtained? Justify your answer with the help of ray diagram. 3

OR

What is meant by power of a lens? You have three lenses L_1 , L_2 and L_3 of powers +10D, +5D and -10D respectively. State the nature and focal length of each lens. Explain which of the three lenses will form a virtual and magnified image of an object placed at 15 cm from the lens. Draw the ray diagram in support of your answer.

12. Two lamps, one rated 100 W at 220 V and the other 200 W at 220V are connected (i) in series and (ii) in parallel to electric main supply of 220V. Find the current drawn in each case. 3

13. The figure below shows three cylindrical copper conductors along with their face areas and lengths. Compare the resistance and the resistivity of the three conductors. Justify your answer. 3



3

14. What is biogas? Describe the steps involved in obtaining biogas. 3

15. How is ozone both beneficial and damaging? How can depletion of ozone layer be prevented? 3

OR

The flow of energy between various components of the environment has been extensively studied. List four findings.

SECTION D

16. a) How will you show experimentally that metals are good conductors of heat. 5
 b) Describe the extraction of Mercury metal from its ore Cinnabar (HgS).

17. A compound A ($C_2H_4O_2$) reacts with Na metal to form a compound 'B' and evolves a gas which burns with a pop sound. Compound 'A' on treatment with an alcohol 'C' in presence of an acid forms a sweet smelling compound 'D' ($C_4H_8O_2$). On addition of NaOH to 'D' gives back B and C. Identify A, B, C and D write the reactions involved. 5

OR

a) Explain why carbon forms covalent bond? Give two reasons for carbon forming a large number of compounds.
 b) Explain the formation of ammonia molecule.

18. a) Draw the diagram of female reproductive system and match and mark the part(s): 5
 i) Where block is created surgically to prevent fertilization.
 ii) Where Copper-T is inserted?
 iii) Inside which condom can be placed.

b) Why do more and more people prefer to use condoms? What is the principle behind use of condoms?

19. Name the phenomenon that governs the following: - 5
 i) Green beetles living in green bushes are not eaten by the crows.
 ii) Number of blue beetles in green bushes increases, only because the red beetles living there were trampled by a herd of elephants.

- iii) No 'medium height plants' are obtained in F1 generation, upon crossing pure tall and dwarf pea plants.
- iv) Tails of mice were surgically removed for several generations; still mice had tails in the following generations.
- v) A migrant beetle reproduces with the local population; as a result genes of migrant beetle enter the new population.

OR

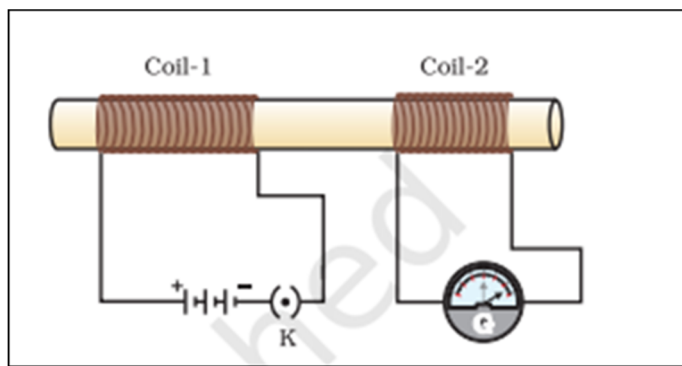
- a) What are fossils and how is age of fossils determined?
- b) During artificial selection, which features of wild cabbage were selected to give rise to i) Cabbage ii) Cauliflower

20. (a) What is meant by the term 'power of accommodation'? Name the component of eye that is responsible for the power of accommodation. 5

(b) A student sitting at the back bench in a class has difficulty in reading. What could be his defect of vision? Draw ray diagrams to illustrate the image formation of the blackboard when he is seated at the (i) back seat (ii) front seat. State two possible causes of this defect. Explain the method of correcting this defect with the help of a ray diagram.

21. (i) With the help of an activity, explain the method of inducing electric current in a coil with a moving magnet. State the rule used to find the direction of electric current thus generated in the coil. 5

(ii) Two circular coils-1 and coil-2 are kept close to each other as shown in the diagram. Coil-1 is connected to a battery and key and coil-2 with a galvanometer. State your observation in the galvanometer:



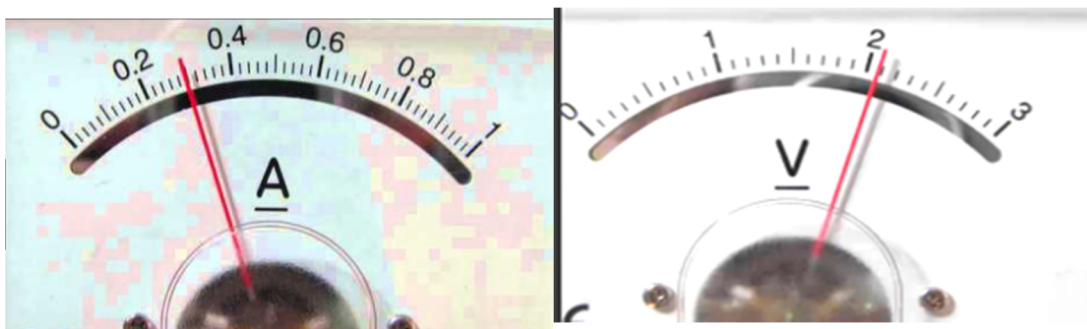
- (a) When key K closed ; (b) when key K is opened;
- Give reason for your observations.

OR

Name a device which converts mechanical energy into electrical energy. Explain the underlying principle and working of this device with the help of a labelled diagram.

SECTION E

22. When few drops of phenolphthalein are added to a dilute solution of sodium hydroxide a pink colour is produced.



What will be the colour of the final mixture when excess of HCl is added to it? (justify your answer)

2

OR

Arrange the metals iron, magnesium, zinc and copper in the increasing order of their reactivity.

What will be the two observations made by the student when iron filings are added to copper sulphate solution? 2

23. From an experiment to study the properties of acetic acid. Answer the following questions: 2

a) Name the substances which on addition to acetic acid produce carbon dioxide gas. Give relevant chemical equation for the above?

b) How is CO_2 gas tested in the laboratory?

24. When observed under high power of the microscope, 'chain of buds' is visible in the microscopic view. In which organism can it be observed? Explain the process.

OR

In the experimental set up on 'CO₂ is released during respiration,' if one forgets to keep the vial with KOH in the conical flask, how will the result vary? Give details. 2

25. You soak seeds of bean and observe them after 2-3 days. List four observations? 2

26. The current flowing through a resistor connected in an electrical circuit and the potential difference developed across its ends are shown in the given ammeter and voltmeter. Find the least count of the voltmeter and ammeter. What is the voltage and the current across the given resistor? 2

27. Consider the path of a ray of light passing through a rectangular glass slab for different angles of incidence. (i) Which one is greater: angle of incidence or angle of refraction? (ii) What happens to the emergent angle on increasing the incident angle at air-glass interface? (iii) State the conditions when no bending occurs. 2

OR

Sunita takes a mirror which is depressed at the centre and mounts it on a mirror stand. An erect and enlarged image of her face is formed. She places the mirror on a stand along a meter scale at 15 cm mark. In front of this mirror, she mounts a white screen and moves it back and forth along the meter scale till a sharp, well-defined inverted image of a distant tree is formed on the screen at 35 cm mark.

- (i) Name the mirror and find its focal length.
- (ii) Why does Sunita get sharp image of the distant building at 35 cm mark?