

SCIENCE

Maximum Marks : 80

Time : 3 to 3½ hours

General Instructions :

1. The question paper comprises of two sections, **A** and **B**, you are to attempt both the sections.
2. All questions are **compulsory**.
3. There is no overall choice. However, internal choice has been provided in all the three questions of five mark category. Only one option in such question is to be attempted.
4. All questions of section A and all questions of section B are to be attempted separately.
5. Question numbers **1** to **4** in section A are one mark questions. These are to be answered in **one word** or **one sentence**.
6. Question numbers **5** to **13** are two mark questions, to be answered in about **30 words**.
7. Question numbers **14** to **22** are three mark questions, to be answered in about **50 words**.
8. Question numbers **23** to **25** are five mark questions, to be answered in about **70 words**.
9. Question numbers **26** to **41** in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to choose one most appropriate response out of the four provided to you.
10. An additional **15** minutes time has been allotted to read this question paper only. Candidates will not write any answer on the answer sheet during this time interval.

SECTION - A

1. The flow of energy in the food chain is unidirectional why ? 1
2. Use of paper bags is more environment friendly than the use of polythene bags for packaging. Justify. 1
3. What is the role of pupil in a human eye ? 1
4. Name the functional group present in Propanone, $\text{CH}_3\text{CO CH}_3$ 1
5. (a) How does formation of coal and petroleum occur ? 2
(b) Name any two products formed when fossil fuels are burnt.
6. How can we as an individual help in reducing the use of fossil fuels ? Mention two ways. 2
7. Explain with the help of two examples how the participation of local people has led to conservation of forest in the past. 2

8. State in brief two functions of copper - T used by some women. 2
9. Light enters from air to kerosene having refractive index. 1.47. What is the speed of light in kerosene ? The speed of light in air is 3×10^8 m/s. 2
10. Why do we observe the seven colours when white light passes through a glass prism ? Which component of white light deviates the least ? 2
11. A person needs a lens of power - 0.5 dioptre for correcting his distant vision. For correcting his near vision he needs a lens of power +1.5 dioptre. What is the focal length of the lens required for correcting his
(i) distant vision, (ii) near vision ? 2
12. Give reasons for the following : 2
(a) Lithium atom is smaller than Sodium atom
(b) Chlorine (Atomic Number 17) is more electronegative than Sulphur (Atomic Number 16)
13. (a) State modern periodic law. 2
(b) State the place of metalloids in the periodic table.
14. The genotype of a plant bearing purple flowers is PP and one with white flowers is pp. When these two are crossed :- 3
(a) what colour of flowers would you find in F1 progeny ?
(b) Give the percentage of white flower if F1 plants are self pollinated ?
(c) In what ratio would you find the genotype PP and Pp in F2 progeny ?
Draw flow chart in support of your answer.
15. (a) What are fossils ? 3
(b) Are the wings of a butterfly and the wings of a bat analogous organs or homologous organs ? Justify your answer.
16. State the role of father and mother in the determination of sex of new born child. Support your answer with a suitable illustration. 3

17. (a) Identify the asexual method of reproduction in each of the following organisms: 3
(i) rose (ii) yeast (iii) planaria
(b) What is fragmentation ? Name a multithcellular organism which reproduces by this method.
18. A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of object from the lens is 30 cm. 3
Find the position and the size of the image formed.
19. A child is able to read his book comfortably but is unable to read the matter written on the blackboard at certain distance. 3
(a) Name the defect of vision he is suffering from.
(b) With the help of labelled ray diagrams show
(i) The above mentioned defect of vision
(ii) Correction of the above mentioned defect using a suitable lens.
20. (a) Why does a ray of light passing through the centre of curvature of a concave mirror after reflection, is reflected back along the same path ? 3
(b) Why are convex mirrors commonly used as rear - view mirrors in vehicles ?
(c) A pencil partly immersed in water in a glass tumbler appears to be displaced at the interface of air and water. Name the phenomenon of light responsible for it.
21. Three elements A, B and C have atomic number 7, 8 and 9 respectively. 3
(a) What would be their positions in the modern periodic table (Mention group and period both).
(b) Arrange A, B and C in the decreasing order of their size.
(c) Which one of the three elements is most reactive and why ?
22. (a) Draw the electron dot structure of - 3
(i) C_2H_2
(ii) C_2H_5OH
(b) What are hydrogenation reactions ? Give an example.
23. (a) Differentiate between germination and fertilization. 2+3
(b) State in brief the functions of the following parts of the human male reproductive system :
(i) Scrotum (ii) Testes (iii) Vas deferens

OR

- (a) Differentiate between pollen grain and ovule.
 (b) State in brief the functions of the following parts of the human female reproductive system.
 (i) Ovary (ii) Fallopian Tube (iii) Uterus

24. A thin converging lens forms a : 2+2+1

- (i) Real magnified image
 (ii) Virtual magnified image of an object placed in front of it
 (a) Write the positions of the objects in each case.
 (b) Draw labelled ray diagrams to show the image formation in each case.
 (c) How will the following be affected on cutting this lens into two halves along the principal axis ?
 (i) Focal length, (ii) Intensity of the image formed by half lens

OR

- (a) For the given data showing object distance and focal length of three concave mirrors, answer the following questions : 1+1+2+1

S No	object distance (cm)	focal length (cm)
1	30	20
2	10	15
3	20	10

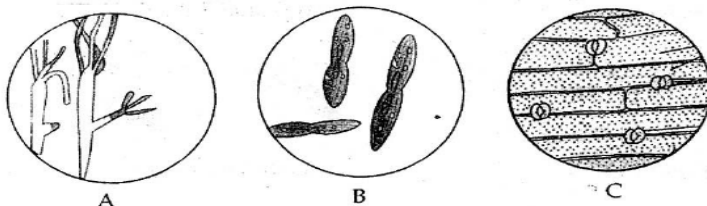
- (i) Out of the three in which case the mirror will form the image having same size as the object ?
 (ii) Which mirror is being used as a make - up mirror ?
 (iii) Draw the ray diagrams for part (i) and part (ii)
 (b) No matter how far you stand from a mirror, your image always appears erect and diminished. Identify the type of mirror.
25. (a) A compound X having formula $C_2H_4O_2$ when treated with Ethanol and a few drops of conc. H_2SO_4 forms a sweet smelling Substance Y. Name X and Y. Write the equation of the reaction leading to the formation of Y from X. What is the function of conc. H_2SO_4 in the above reaction ? 3+2
 (b) Why do soaps form scum instead of lather in hard water ?

OR

- (a) Name the main product formed when : 3+2
 (i) Ethanoic Acid is treated with Sodium Bicarbonate.
 (ii) Ethanol is heated with Alkaline $KMnO_4$ Solution
 (iii) Ethyl Ethanoate is treated with NaOH solution
 Also write the chemical equation for each of the above reactions.

SECTION - B

26. The slide of budding in yeast is represented by : 1



- (a) A (b) B (c) C (d) none of these

27. Binary fission in Amoeba is depicted by : 1



- (a) A (b) B (c) C (d) D

28. Students A, B and C took raisins of equal weights. The raisins were soaked in water at room temperature. A removed raisins after 15 minutes, B after two hours and C after 45 minutes. 1

If $P(A)$, $P(B)$ and $P(C)$ denote the percentage of water absorbed by raisins respectively, then :-

- (a) $P(A) > P(B) > P(C)$ (b) $P(A) < P(B) < P(C)$
 (c) $P(B) > P(C) > P(A)$ (d) $P(A) = P(B) = P(C)$

29. To determine the percentage of water absorbed by raisins before final weighing of the raisins after being kept dipped in water for about 90 minutes extra water from the soaked raisins is removed by : 1

- (a) hot air blower (b) dry cotton
 (c) cotton cloth (d) filter paper

30. A student was given four slides (A), (B), (C) and (D) where details are shown below. 1

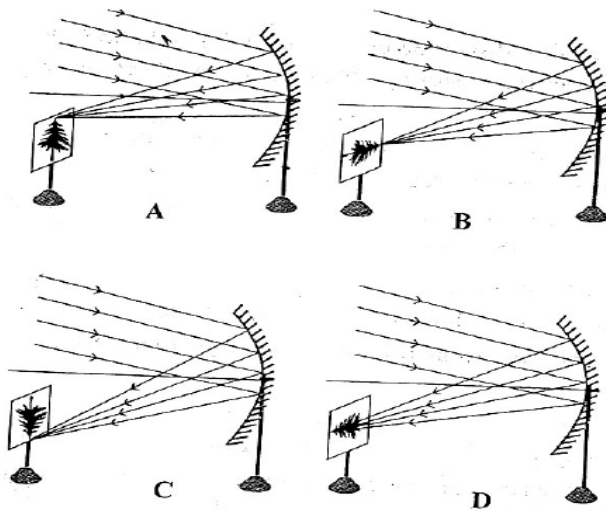


For observing budding in yeast he should place under the microscope the slide marked :

- (a) A (b) B (c) C (d) D

34. A student while tracing the path of a ray of light through a glass slab must take the precautions.
- Range of incident angle should $30^{\circ} - 60^{\circ}$
 - The eye must be in line with the feet of the pins
 - The pins used must have sharp point and stand vertically on the board
 - Distance between two pins must be nearly 8 cm.
- (a) I and II (b) II and III
(c) II, III and IV (d) All of these

35. Parallel rays, from the top of a distant tree, incident on a concave mirror, form an image on the screen. The correct diagram showing the image is :



- (a) A (b) B (c) C (d) D

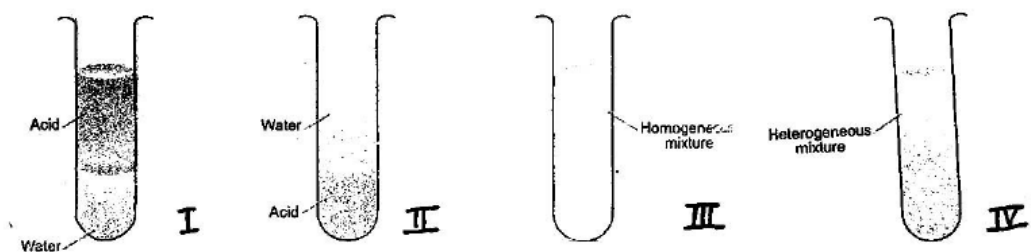
36. Three students measured the focal length of a convex lens using parallel rays from distant object. All of them measure the distance between the lens and the inverted image on screen. While shifting the lens slowly towards the object Student A saw a sharp image on the screen and labelled the distance as f_1 Student B saw a slightly larger blurred image on the screen and labelled the distance as f_2

Student C saw a still larger blurred image on the screen and labelled the distance as f_3

The relation likely to be is :

- (a) $f_1 = f_2 = f_3$
(b) $f_1 < f_2$ and f_3
(c) $f_3 > f_2 > f_1$
(d) $f_1 < f_2$ and $f_1 = f_3$

37. A student puts an iron nail in four test tubes containing solutions of zinc sulphate, aluminium sulphate, copper sulphate and iron sulphate. A reddish brown coating was observed only on the surface of iron nail which was put in the solution of : 1
- (a) zinc sulphate (b) iron sulphate
(c) copper sulphate (d) aluminium sulphate
38. 10ml of freshly prepared iron sulphate was taken in each of four test tubes. Strips of copper, iron, zinc and aluminium were put in these test tubes. A black residue was obtained in two of them. The right pair of metals forming the black residue are : 1
- (a) Cu and Zn (b) Al and Cu
(c) Fe and Al (d) Zn and Al
39. 5ml each of acetic acid and water are mixed together and shaken well. 1



The resulting mixture after standing for some time would appear as :

- (a) I (b) II (c) III (d) IV
40. When sodium bicarbonate is added to acetic acid, a gas evolves. Which one of the following statements is not true for this gas ? It : 1
- (a) turns lime water milky
(b) extinguishes burning splinter
(c) burns explosively
(d) dissolves sparingly in water.
41. When blue litmus is added to a solution of acetic acid, it turns red. When excess of NaOH is added to the above solution, it will be observed that the mixture : 1
- (a) remains red
(b) becomes colourless
(c) turns blue
(d) turns green