Goa Board
Class X Science
Term II
Sample Paper – 3

Total time: 3 hrs **Total marks: 90**

General instructions:

1. *The question paper comprises of **two sections, A and B**. You are to attempt both the sections.*
2. *All the questions of **Section-A** and **Section-B** are to be attempted separately.*
3. *Question numbers **1** to **3** in **Section - A** are **one mark** questions. These are to be answered in one word or one sentence.*
4. *Question numbers **4** to **6** in **section - A** are **two marks** questions, to be answered in about **30 words each**.*
5. *Question number **7** to **18** in **section-A** are **three marks** questions, to be answered in about **50 words**.*
6. *Question number **19** to **24** in **section-A** are **five marks** questions, to be answered in about **70 words**.*
7. *Question numbers **25** to **33** in **section-B** are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.*
8. *Question numbers **34 to 36** in Section B are questions based on practical skills and are two marks questions.*

SECTION A

1. Identify the functional group in the following compounds: [1]

i. $CH_3CH_2COCH_3$

ii. CH_3CHO

2. Why are stop signals on roads made of red colored light? [1]

3. Who was the first person to devise the principles of inheritance? [1]

4. How were the positions of cobalt and nickel resolved in the Modern Periodic Table? [2]

5. [2]

(a) Why are coal and petroleum called fossil fuels?

(b) Name any two elements present in fossil fuels in addition to carbon.

6. Why do stars twinkle at night? [2]

7. List any four disadvantages of using fossil fuels for the production of energy. [3]

8. [3]

(a) Explain why atomic number is more important than atomic mass in determining chemical properties?

(b) What is the cause of periodicity in the properties of elements?

9.

(a) Draw the structures for following compounds: [3]

i. ethanoic acid

ii. butanone

(b) Conversion of ethanol to ethanoic acid is considered an oxidation reaction. Why?

10. Electronic configurations of elements X, Y and Z are given below: [3]

X = 2, 7

Y = 2, 8, 5

Z = 2, 8, 8

Write the position of these elements in the Modern Periodic Table.

11.

(a) State Snell's law of refraction of light.

(b) A transparent medium A floats on another transparent medium B. When a ray of light travels obliquely from A into B, the refracted ray bends away from the normal. Which of these two media A or B are optically denser and why? [3]

12.

(a) Find the position of the image formed when an object of size 1 cm is placed at a distance of 15 cm from a concave mirror of focal length 10 cm.

(b) What is the focal length of a plane mirror? [3]

13. State the difference in colours of the sun observed during sunrise/sunset and at noon. Give explanation for each. [3]

14. [3]

(a) A convex lens has a focal length of 40 cm. Calculate its power.

(b) Which defect of vision can be rectified using a concave lens?

15. [3]

(a) Differentiate between autotrophs and heterotrophs.

(b) Who constitutes the first trophic level in a food chain?

16. [3]

(a) What are genes?

(b) Where are genes located?

(c) What is the nature of genes?

17. Give an example of body characteristics used to determine how close two species are in terms of evolution and explain it. [3]

18. [3]

(a) What is fertilization?

(b) Distinguish between external and internal fertilization.

(c) What is the site of fertilization in human beings?

19. [5]

(a) How do potato plant and bryophyllum plants reproduce?

(b) How can inefficient mango trees be used to bear good quality mangoes?

20.

(a) Give the IUPAC name of the following: [5]

i. CH_3CH_2OH

ii. $CH_3CHBrCH_3$

(b) What is difference between the formulas of the two successive members of a homologous series?

(c) What kind of flame is produced when unsaturated hydrocarbons are burnt over a flame?

(d) Give an example of addition reaction. Write the chemical reaction also.

21.

(a) What do you mean by linear magnification produced by mirrors?

(b) The power of a lens is +1.5 D. What kind of lens it is and what is its focal length?

(c) Draw a ray diagram of an image when an object is placed on the principal axis of a convex lens between the focus and the optical centre. [5]

22.

(a) State the reasons for the following observations recorded from the surface of the moon:

i. Sky appears dark.

ii. Rainbow is never formed.

(b) How is cataract caused? How it can be cured?

(c) Which type of retinal cells respond to brightness of light? [5]

23. Describe the law of independent assortment with the help of an example. [5]

24. [5]

(a) List any two advantages of vegetative propagation.

(b) Diagrammatically explain the reproduction in Amoeba.

(c) Where does fertilization occur in the female reproductive tract?

SECTION B

25. In an experiment to trace the path of a ray of light through a glass prism for different values of the angle of incidence, a student would find that the emergent ray: [1]

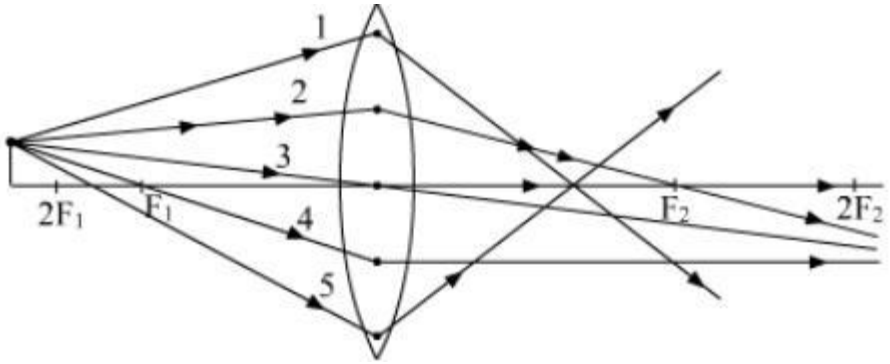
(a) Is parallel to the incident ray

(b) Perpendicular to the incident ray

(c) Is parallel to the refracted ray

(d) Bends at an angle to the direction of incident ray

26. Out of the five incident rays shown in the figure, find the three rays that are obeying the laws of refraction and may be used for locating the position of the image formed by a convex lens: [1]



(a) 1, 2 and 3

(b) 2, 3 and 4

(c) 3, 4 and 5

(d) 1, 2 and 4

27. The water absorbed by raisins is calculated as: [1]

(a) Weight of wet raisins-weight of dry raisins.

(b) Weight of dry raisins-weight of wet raisins.

(c) Weight of water in Petridis-weight of wet raisin.

(d) Weight of dry raisins + weight of wet raisins.

28. A student has to observe a permanent slide of binary fission in amoeba. Find the correct sequence of steps given below for focusing the object under a microscope. [1]

(a) Place the slide on the stage, look through the eye-piece and adjust the mirror to get proper illumination.

(b) Focus the slide sharp, using fine adjustment screw.

(c) Look through the eye-piece and raise the objective lens using coarse adjustment screw till the object is focused.

(d) Look through the eye-piece and move the slide till the object is visible.

(A) d, c, b, a

(B) a, b, d, c

(C) a, d, c, b

(D) a, c, d, b

29. Fresh grapes shrink when placed in a solution. The solution must be: [1]

(a) Hypotonic

(b) Isotonic

(c) Hypertonic

(d) All of these

30. The odour of ethanoic acid resembles: [1]

(a) Tomato juice

(b) Kerosene

(c) Orange juice

(d) Vinegar

31. On adding sodium bicarbonate to acetic acid, you immediately: [1]

(a) Observe brisk effervescence

(b) Hear hissing sound

(c) Get pungent smell

(d) Notice formation of bubbles

32. The oxidising agent used to convert alcohols into carboxylic acid is: [1]

(a) Alkaline $KMnO_4$

(b) PCl_3

(c) Conc. H_2SO_4

(d) Sodium

33. Name the functional group of the product formed when ethanol reacts with ethanoic acid. [1]

(a) Ester

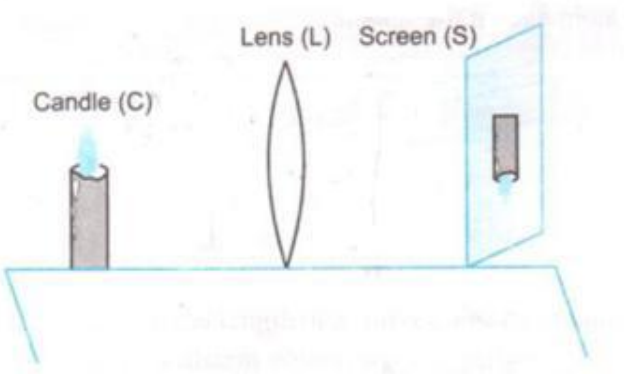
(b) Aldehyde

(c) Ketone

(d) Ether

34. A student performs an experiment of finding the focal length of a convex lens by keeping a lighted candle on one end of the laboratory table, a screen on its other end and the lens between them as shown in the figure. The positions of the three are adjusted to get a sharp image of the candle flame on the screen.

If now the candle flame were to be replaced by a distant lamp on a far away electric pole, the student would be able to get a sharp image of this distant lamp on the screen by moving: [2]



(a) the screen in the direction of the lens or the lens in the direction of the screen
(b) the screen in the direction of the lens or the lens away from the screen
(c) the screen away from the lens or the lens in the direction of the screen
(d) neither the screen nor the lens

35. Complete the following reactions and name the main product formed in each case. [2]

i. $CH_3CH_2OH \xrightarrow{\text{Alkaline } KMnO_4}$

ii. $CH_3COOC_2H_5 \xrightarrow{NaOH}$

36. While performing the experiment with raisins to determine the percentage of water absorbed by them, a student made following measurements: [2]

Mass of water in the beaker = 40 g
Mass of raisins before soaking = 5 g
Mass of raisins after soaking for 2 hours = 8 g
Mass of water left in the beaker after the experiment = 35 g
The percentage of water absorbed by raisins is:

(a) $\frac{40g-35g}{35g}\times 100$

(b) $\frac{40g-35g}{40g}\times 100$

(c) $\frac{8g-5g}{8g}\times 100$

(d) $\frac{8g-5g}{5g}\times 100$