

CBSE
Class X Science
Board Paper – 2012 (Set 3)
Term II

Total time: 3 hrs

Total marks: 80

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 marks category. Only one option in such question is to be attempted.
4. All questions for **Section A** and all questions of **Section B** are to be attempted separately.
5. Questions number **1 to 4** in **Section A** are **one mark** question. These are to be answered in one word or one sentence.
6. Question numbers **5 to 13** in **Section A** are **two marks** questions. These are to be answered in about **30 words each**.
7. Question numbers **14 to 22** in **Section A** are **three marks** questions. These are to be answered in about **50 words each**.
8. Question numbers **23 to 25** in **Section A** are **five marks** questions. These are to be answered in about **70 words each**.
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 select one most appropriate response out of the four provided to you.

SECTION A

1. Name the functional group present in each of the following organic compounds: [1]
 - i. CH_3COCH_3
 - ii. $\text{C}_2\text{H}_5\text{COOH}$
2. Which phenomenon is responsible for making the path of light visible? [1]
3. Which class of carbon compounds are responsible for the depletion of ozone layer at the higher level of the atmosphere? [1]

4. Select two non-biodegradable substances from the following waste generated in a kitchen: [1]
Spoilt food, paper bags, milk bags, vegetable peels, tin cans, used tea leaves.
5. Define the term puberty. List two changes observed in girls at the time of puberty. [2]
6. What is meant by asexual reproduction? List any two of its different forms. [2]
7. What are the advantages of water stored in the ground? [2]
8. 'Burning fossil fuels is a cause of global warming.' Justify this statement. [2]
9. When we place a glass prism in the path of a narrow beam of white light, a spectrum is obtained. What happens when a second identical prism is placed in an inverted position with respect to the first prism? Draw a labelled ray diagram to illustrate it. [2]
10. List four properties of the image formed by a concave mirror when an object is placed between the focus and pole of the mirror. [2]
11. An element 'M' has atomic number 12. [2]
(a) Write its electronic configuration.
(b) State the group to which 'M' belongs.
(c) Is 'M' a metal or a non-metal?
(d) Write the formula of its oxide.
12. How can the valency of an element be determined if its electronic configuration is known? What will be the valency of an element of atomic number 9? [2]
13. A star at times appears bright and at times fainter. What is this effect called? State the reason for this effect. [2]
14. F, Cl and Br are elements each having seven valence electrons. Which of these:
i. has the largest atomic radius
ii. is most reactive?
Justify your answer stating reason for each. [3]

15. Explain the meaning of sexually transmitted diseases (STD's). Give two examples of STD's each, caused due to [3]
 i. bacterial infection
 ii. viral infection.
 State in brief how the spread of such diseases may be prevented.
16. Distinguish between homologous organs and analogous organs. In which category would you place wings of a bird and wings of bat? Justify your answer giving a suitable reason. [3]
17. Define the term 'evolution'. 'Evolution cannot be equated with progress'. Justify this statement. [3]
18. A blue colour flower plant denoted by BB is crossbred with a white colour flower plant denoted by bb. [3]
 (a) State the colour of flower you expect in their F_1 generation plants.
 (b) What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?
 (c) State the expected ratio of the genotypes BB and Bb in the F_2 progeny.
19. Complete the following equations: [3]
 (a) $\text{CH}_4 + \text{O}_2 \rightarrow$
 (b) $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Hot conc. H}_2\text{SO}_4}$
 (c) $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow$
20. A student cannot see a chart hanging on a wall placed at a distance of 3m from him. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagrams for the: [3]
 i. defect of vision
 ii. for its correction
21. State the type of mirror preferred as [3]
 i. Rear view mirrors in vehicles
 ii. Shaving mirrors. Justify your answer giving two reasons in each case
22. The image of a candle flame placed at a distance of 36 cm from a spherical lens is formed on a screen placed at a distance of 72 cm from the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 2.5 cm, find the height of the image. [3]

23. List the sign conventions for reflection of light by spherical mirrors. Draw a diagram and apply these conventions in the determination of focal length of a spherical mirror which forms a three times magnified real image of an object placed 16 cm in front of it.

[5]

OR

State the law of refraction of light which defines the refractive index of a medium with respect to the other. Express it mathematically. How is refractive index of any medium 'A' with respect to a medium 'B' related to the speed of propagation of light in two media A and B? State the name of this constant when one medium is vacuum or air.

The refractive indices of glass and water with respect to vacuum are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. If the speed of light in glass is 2×10^8 m/s, find the speed of light in

- i. vacuum
- ii. water

24. What is the difference between the chemical composition of soaps and detergents? State in brief the soaps in removing an oily spot from a shirt. Why soaps are not considered suitable for washing when water is hard?

[5]

OR

List in tabular form three physical and two chemical properties on the basis of which ethanol and ethanoic acid can be differentiated.

25. Define the terms pollination and fertilisation. Draw a diagram of a pistil showing pollen tube growth into the ovule and label the following: pollen grain, male gamete, female gamete and ovary.

[5]

OR

Describe in brief the role of

- i. testis
- ii. seminal vesicle
- iii. vas deferens
- iv. ureter
- v. prostate gland in human male reproductive system.

SECTION B

26. After observing the prepared slides of binary fission in Amoeba and budding in yeast, the following observations were reported: [1]

- Single cells of Amoeba and Yeast were undergoing binary fission and budding respectively.
- Cytokinesis was observed in the Yeast cell.
- Elongated nucleus was dividing to form two daughter nuclei in Amoeba.
- A chain of buds were observed due to reproduction in Amoeba.

The correct observation(s) is/are:

- d, a and c
- c and d
- b only
- a and c

27. A student after viewing a prepared slide illustrates budding in yeast in the following order which is not correct: [1]



The correct order should be:

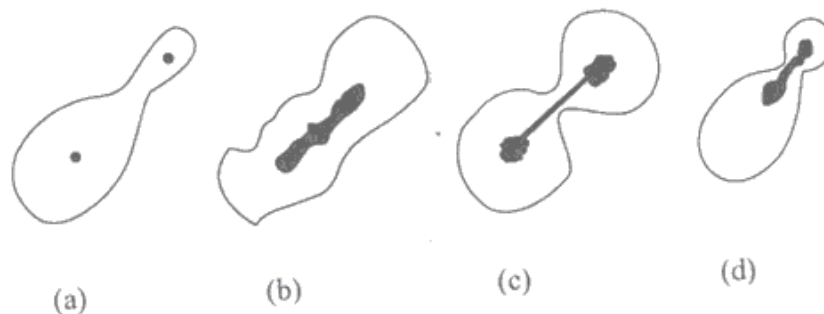
- b, d, e, c, a
- b, e, d, c, a
- b, c, d, e, a
- b, d, c, e, a

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]

- Place the slide on the stage, look through the eye-piece and adjust the mirror to get proper illumination.
- Focus the slide sharp using fine adjustment screw.
- Look through the eye-piece and raise the objective lens using coarse adjustment screw till the object is focused.
- Look through the eye-piece and move the slide till the object is visible.

- a, c, d, b
- d, c, b, a
- a, b, d, c
- a, d, c, b

29. After viewing different slides, a student draws the following diagrams. Select the one which depicts binary fission in Amoeba: [1]



- (a) d
(b) b
(c) a
(d) c
30. Dry raisins were soaked in water for 2 hours to determine the percentage of water absorbed by raisins. Before final weighing of swollen raisins, the extra water left on the surface of soaked raisins was removed by: [1]
- (a) Dry cotton wool
(b) Hot air blower
(c) Gently rubbing with cotton cloth
(d) Filter paper
31. While performing the experiment with raisins to determine the percentage of water absorbed by them, a student made the following measurements: [1]

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 three experiments = 35 g

The percentage of water absorbed by raisins is:

- (a) $\frac{8\text{ g} - 5\text{ g}}{8\text{ g}} \times 100$
(b) $\frac{40\text{ g} - 35\text{ g}}{40\text{ g}} \times 100$
(c) $\frac{40\text{ g} - 35\text{ g}}{35\text{ g}} \times 100$
(d) $\frac{8\text{ g} - 5\text{ g}}{5\text{ g}} \times 100$

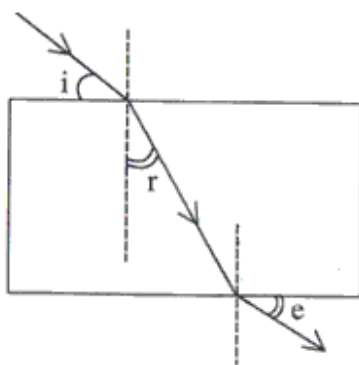
- 32.** Which of the following observations is true about dilute solution of acetic acid? [1]
- (a) It smells like vinegar and turns red litmus blue
 - (b) It smells like onion and turns blue litmus blue
 - (c) It smells like orange and turns red litmus blue
 - (d) It smells like vinegar and turns blue litmus red
- 33.** A student takes Na_2CO_3 powder in a test tube and pours some drops of acetic acid in it. He observes: [1]
- (a) No reaction in the test tube
 - (b) Colourless gas with pungent smell
 - (c) Bubbles of a colourless and odourless gas
 - (d) White fumes with smell of vinegar
- 34.** A student adds 4 ml of acetic to a test tube containing 4 ml of distilled water. He then shakes the test tube and leaves it to settle. After about 10 minutes he observes: [1]
- (a) A layer of water over the layer of acetic acid
 - (b) A layer of acetic acid over the layer of water
 - (c) A precipitate settling at the bottom of the test tube
 - (d) A clear colourless solution
- 35.** The colours of aqueous solutions of CuSO_4 and FeSO_4 as observed in the laboratory are: [1]
- (a) Pale green and light blue respectively
 - (b) Light blue and dark green respectively
 - (c) Dark blue and dark green respectively
 - (d) Dark blue and pale green respectively
- 36.** A student prepared an aqueous solution of CuSO_4 in beaker X and an aqueous solution of FeSO_4 in beaker Y. He then dropped some iron pieces in beaker X and some zinc pieces in beaker Y. After about 10 hours, he observed that the solution in X and Y respectively appears: [1]
- (a) Blue and green
 - (b) Colourless and pale green
 - (c) Colourless and light blue
 - (d) Greenish and colourless

37. While tracing the path of a ray of light passing through a rectangular glass slab a student tabulated his observations as given below: [1]

S.No.	$\angle i$	$\angle r$	$\angle e$
I	60°	40°	61°
II	50°	36°	51°
III	40°	28°	39°
IV	30°	20°	31°

The correct observation is:

- (a) I
(b) II
(c) III
(d) IV
38. A student traces the path of a ray of white light through a rectangular glass slab and marks the angles of incidence ($\angle i$), refraction ($\angle r$) and emergence ($\angle e$) as shown. Which angle or angles have not been marked correctly? [1]



- (a) $\angle i$ only
(b) $\angle i$ and $\angle r$
(c) $\angle r$ and $\angle e$
(d) $\angle i$ and $\angle e$

39. To determine the focal length of a convex lens by obtaining a sharp image of a distant object we generally follow the following steps which are not in proper sequence. [1]

- a. Hold the lens between the object and the screen
- b. Measure the distance between the lens and the screen
- c. Select a well lit distant object
- d. Place a screen opposite to the object on the lab table
- e. Adjust the position of the lens to form a sharp image

The correct sequence of these steps is:

- (a) c, a, d, e, b
- (b) c, d, a, e, b
- (c) c, d, e, a, b
- (d) c, a, e, d, b

40. A student obtained a sharp image of the grills of a window on a screen using a concave mirror. His teacher remarked that for getting better results a well lit distance object (preferably the Sun) should be focused on the screen. What should be done for this purpose? [1]

- (a) Move the screen and the mirror towards the object
- (b) Move the screen and the mirror away from the object
- (c) Move the screen slightly away from the mirror
- (d) Move the mirror slightly towards the screen

41. To determine focal length of a concave mirror a student obtains the image of a well lit distant object on a screen. To determine the focal length of the given concave mirror he needs to measure the distance between the: [1]

- (a) Cannot be determined
- (b) Screen and the object
- (c) Mirror and the object
- (d) Mirror and the screen