Sample Paper 2
CBSE X Science (Theory)
Term - 2

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. There is no overall choice. However, internal choice has been provided in all the five questions of five marks category. Only one option in such question is to be attempted.
3. All the questions of **Section-A** and **Section-B** are to be attempted separately.
4. Question numbers **1** to **3** in **Section - A** are **one mark** questions. These are to be answered in one word or one sentence.
5. Question numbers **4** to **7** in **section - A** are **two marks** questions, to be answered in about **30 words each**.
6. Question number **8** to **19** in **section-A** are **three marks** questions, to be answered in about **50 words**.
7. Question number **20** to **24** in **section-A** are **five marks** questions, to be answered in about **70 words**.
8. Question numbers **25** to **42** 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. Which bonding is mostly shown by carbon in its compounds?

2. What happens to light when it passes through a prism?

3. Rearrange the following according to their ascending tropic levels in a food chain: Hawk, snake, grass, rabbit

4. Lithium, sodium and potassium are all elements that react with water to liberate hydrogen gas. Is there any similarity in the atoms of these elements? Explain.

5. What is the importance of a watershed management system?

6. a) Name the male and female gamete in humans.

   b) Where does fertilization take place in females?

7. (a) What is vegetative propagation?
   (b) List one advantage of vegetative propagation.

8. (a) How does chemical reactivity of metals and non-metals vary on going down in a group?
   (b) Is it possible to have an element having atomic number 1.5 placed between hydrogen and helium?
   (c) Amongst lithium and potassium, which is larger in size and why?

9. Dentists use concave mirrors to view teeth inside patient's mouth. Why? Represent using a ray diagram. Why not a convex mirror is used?

10. An object 2 cm high is placed at a distance of 16 cm from mirror that produces a real image 3 cm high.

    (a) Find the position of the image (b) What is the focal length of the mirror?

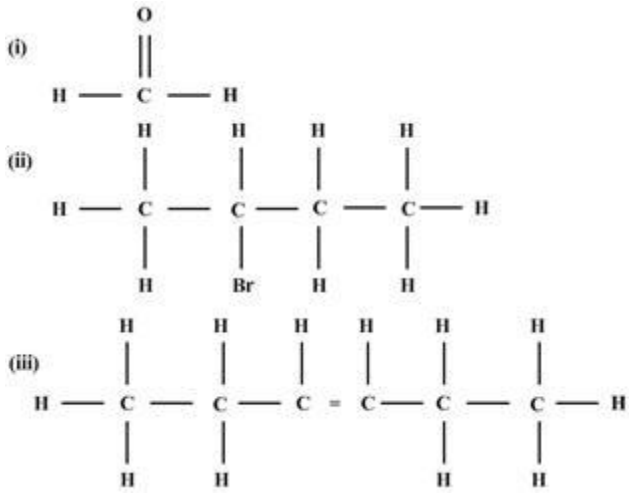
11. Sania and Shreya are best friends and study in grade 4, recently, Sania has been facing difficulty in reading the black-board text from the last desk. Shreya is little uncomfortable and wonders why sania avoids sitting on the last desk. On observation she found that sania often carries junk food in her lunch. Shreya has started sharing her lunch - full of green vegetables and fruits with her. Sania is now better and has also started taking a 'balanced diet'.
    (i) Name the eye defect Sania is suffering from?
    (ii) What are the two possible causes of her eye defect?
    (iii) What values is shown by Shreya and Sania?

12. (a) Why does white light undergo dispersion?
    (b) What is the range of wavelength of visible light?

13. (a) Why physical properties and chemical properties of an element are periodic function of their atomic numbers?
    (b) How does Modern Periodic Law justifies one position for isotopes?

14. (a) Write the structures of the following compounds.
    (i) Formic acid
    (ii) 2-pentanone
    (iii) Heptanal

(b) Give IUPAC name the following compounds?



15. (a) Why are testes placed outside the abdominal cavity in scrotum?
(b) What is the aim of the mechanical barrier method of contraception? Give an example of this contraceptive.

16. (a) i) In a cross between a white flowered plant and pink flowered plant, the F_1 generation was found to be pink. On this basis, which are the dominant and the recessive traits?
ii) What is the ratio of the plants in F_2 generation?

(b) Mendel said that the characteristics (traits) of organisms are carried from one generation to the next by internal factors which occur in pairs. What is the modern name for these factors?

17. (a) Why Mendel chose pea plant for his experiments? Mention any two reasons.
(b) Will experiences of a person during his life time be passed to the next generation?

18. (a) Mention any two advantages of variations in individuals.
(b) i) A human being has XY pair of sex chromosome. Is it a male or a female?
ii) Give an example where environmental factors play a major role in sex determination.

19. (a) Name the tissue which provides nutrition to the developing embryo.
(b) What is the function of:
i) Seminal vesicles
ii) Uterus

20. (a) Why in a molecule of nitrogen, two atoms are joined by a triple bond?
(b) Give three points to distinguish between saturated and unsaturated hydrocarbons.

OR

(a) State any three characteristics of a homologous series.
(b) What is the valency of carbon? How it satisfies its valency in a molecule of methane?

21. (a) How is image distance, object distance and focal length of a lens are related to each other? Why focal length of convex lens is considered positive and that of concave lens is considered negative?
(b) An object is placed at a distance of 20 cm from a convex lens of radius of curvature of 20 cm. Find the nature, position and size of the image.

OR

Image of an object formed by convex lens is of same size as object of 8 cm.
(a) What is the position of object and the image in such a case?
(b) Represent using a ray diagram.
(c) Given a series of lens of known focal lengths: + 5cm, + 10cm, - 5cm, - 10cm, - 20cm, - 25cm.
(i) Pick any four lenses and arrange them in the order of increasing bending power.
(ii) Identify any two lens of same bending power.
(iii) Will convex and a concave lens of same focal length (same numerical value) have similar extent of bending power? What will be the difference in nature of bending in such a case?

22. (a) With the help of a ray diagram show that concave lens is a diverging lens?
(b) Represent using a ray diagram, how the defect of hypermetropia can be corrected.
(c) What does negative magnification mean?

OR

(a) The far point of a myopic person is 40 cm in front of the eye. What is the nature and power of the lens required to correct the problem?
(b) How does the brain perceive the image formed on the retina?
(c) What are the units of refractive index?

23. (a) With the help of an example explain how "Genes control characteristics or traits".
(b) Give two examples where environmental factors govern the sex determination.

Or

(a) What is meant by the terms:
(i) Haploid

(ii) Diploid

(b) How are chromosomes, DNA and genes related to each other?

(c) How the individuals with a particular trait may increase in a population by genetic drift?

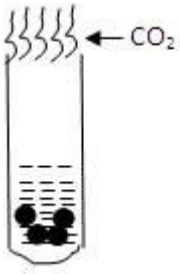
24. (a) i) What happens to the thickened uterine lining if no fertilization occurs?
ii) What is the process called?
iii) What is the duration of this process?
(b) Why does menstruation occur once a month?
(c) The blood of the mother never mixes with that of the foetus yet it nourishes the foetus, how?

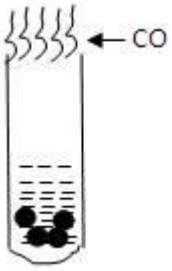
OR

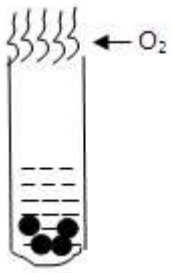
(a) i) Why spore formation is beneficial for fungi?
ii) How is multiple fission advantageous for plasmodium?
iii) What type of division occurs in asexual reproduction?
(b) Diagrammatically explain the process of fertilization taking place in a flowering plant.

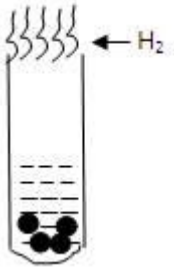
Section B

25. Acetic acid reacts with zinc in all the test tubes. A pop sound is heard when a burning match stick is brought near the test tubes. Which test tube will produce this pop sound?

A. 

B. 

C. 

D. 

26. Raisins selected for the experiment should:
    A. Have intact stalks
    B. Be swollen raisins
    C. Be without stalks
    D. None of these

27. 5gm of raisins were placed in distilled water for 24 hours. The weight of soaked raisins was found to be 7 gm. The correct percentage of water observed by raisins is:
    A. 20%
    B. 25%
    C. 40%
    D. 45%

28. A student adds a few drops of universal indicator to an aqueous solution of sodium hydroxide. He would observe that the colour of the solution changes from:
    A. Colourless to red.
    B. Colourless to blue.
    C. Red to blue.
    D. Blue to red.

29. The colour of the pH paper strip turned red when it was dipped into a sample. The sample could be:
    A. Dilute sodium bicarbonate
    B. Tap water
    C. Dilute sodium hydroxide
    D. Dilute hydrochloric acid

30. A student added sodium bicarbonate solution to dilute ethanoic acid. He observed that:
    A. A gas evolves
    B. A solid settles at the bottom
    C. The colour of the mixture becomes blue
    D. The colour of the mixture becomes light yellow

31. A student dipped a pH paper in an unknown liquid. Orange colour was obtained. The unknown solution can be:
    A. Acetic acid
    B. Ethanoic acid
    C. Sodium carbonate
    D. Both acetic acid and ethanoic acid

32. During the budding, division of cell in yeast shows:
    A. Meiosis cell division
    B. Mitosis cell division
    C. Both mitosis and meiosis cell division
    D. No cell division occurs

33. A student sowed two pieces of potato (A) with eye, (B) without eye. In which case plant will grow:
    A. A
    B. B
    C. Both
    D. None

34. Which of the following organisms shows budding?
    A. Spirogyra
    B. Hydra
    C. Amoeba
    D. Paramecium

35. Three students measured the focal length of a convex lens using parallel rays from distant object. All of them measured 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 labeled the distance as f_1, student B saw a slightly larger blurred image on the screen and labeled the distance as f_2, student C saw a still larger blurred image on the screen and labeled 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 $f_1 = f_3$

36. Three students X, Y and Z are finding the focal length of the given concave mirror by obtaining the image of the object selected by them. X obtains the image of the grill of the nearest window of the lab. Y obtains the image of a white painted building near the lab and Z obtains a point size image of the sun. The most correct value of the focal length is obtained by:

A. X

B. Y

C. Z

D. X and Y both

37. An experiment to trace the path of a ray of light through a glass slab was performed by four students A, B, C and D. They reported the following measurements of angle of incidence i angle of refraction r and angle of emergence e. The student who has performed the experiment seriously by observing all possible precautions is

Student	angle 'i'	angle 'r'	angle 'e'
A	60	35	59
B	55	40	50
C	40	30	45
D	35	40	30

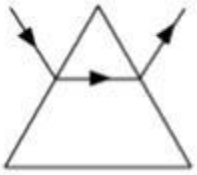
A. A

B. B

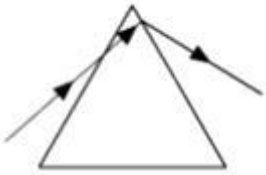
C. C

D. D

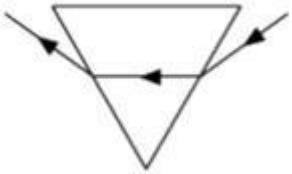
38. While performing the experiment to trace the path of a ray of light passing through a glass prism, four students marked the incident ray and the emergent ray in their diagrams in the manner shown below.
(i)



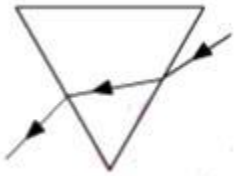
(ii)



(iii)



(iv)



Which one is correct?

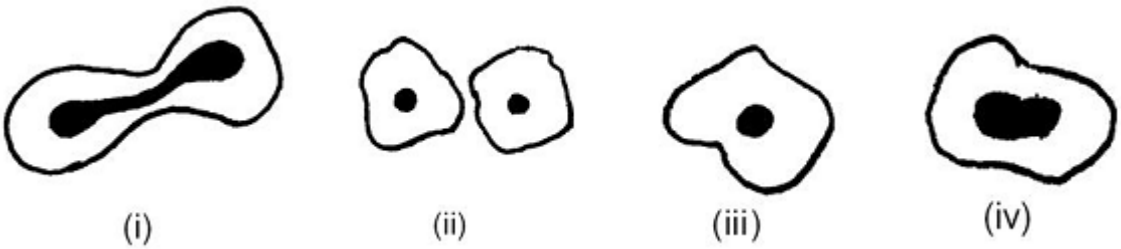
A. I

B. II

C. IIII

D. IV

39. The following figure illustrates binary fission in Amoeba in an incorrect sequence. The correct sequence is



A. I, iii, iv, ii

B. iii, ii, iv, i

C. iv, iii, ii, i

D. iii, iv, ii, i

40. The alkaline hydrolysis of oils and fats is called:
    A. Decarboxylation
    B. Esterification
    C. Saponification
    D. Acidic dehydration

41. What will be the position of point source to get a parallel beam of light when light from a point source is incident on a convex lens?
    A. At $2F_1$
    B. At F_1
    C. Between $2F_1$ and F_1
    D. Between F_1 and optical centre

42. A student has to perform an experiment on tracing the path of a ray of light passing through a rectangular glass slab for three different angles of incidence. Four of his friends suggest the following options to him:

    A: Draw the incident rays corresponding to 20^o, 50^o and 70^o as the angles of incidence and fix the two pins on the incident rays just 2 cm apart
    B: Draw the incident rays corresponding to 20^o, 45^o and 70^o as the angles of incidence and fix the two pins on the incident rays just 8 cm apart
    C: Draw the incident rays corresponding to 30^o, 45^o and 60^o as the angles of incidence and fix the two pins on the incident rays nearly 8 cm apart
    D: Draw the incident rays corresponding to 30^o, 45^o and 60^o as the angles of incidence and fix the two pins on the incident rays nearly 2 cm apart
    The best option that he should follow is the option:
    A. A
    B. B
    C. C
    D. D