

## CBSE Exam - 2013

### General Instructions:

- (i) The question paper comprises of two Sections, A and B. You are to attempt both the sections.
- (ii) All questions are compulsory.
- (iii) All question of Section-A and all questions of Section-B are to be attempted separately.
- (iv) Question numbers 1 to 3 in Section-A are one mark questions. These are to be answered in one word or in one sentence.
- (v) Question numbers 4 to 7 in Sections-A are two marks questions. These are to be answered in about 30 words each.
- (vi) Question number 8 to 19 in Section-A are three marks questions. These are to be answered in about 50 words each.
- (vii) Question numbers 20 to 24 in Section-A are five marks questions. These are to be answered in about 70 words each.
- (viii) 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. How many vertical columns are there in the modern periodic table and what are they called?
2. What is speciation?
3. Why should biodegradable and non-biodegradable wastes be discarded in two separate dust bins?
4. “The chromosomes number of the sexually reproducing parents and their offspring is the same.” Justify this statement.
5. “A ray of light incident on a rectangular glass slab immersed in any medium emerges parallel to itself.” Draw labelled ray diagram to justify the statement.
6. We often observe domestic waste decomposing in the bylanes of residential colonies. Suggest ways to make people realise that the improper disposal of waste is harmful to the environment.
7. List and explain any two advantages associated with water harvesting at community level.
8. Write the name and the structural formula of the compound formed when ethanol is heated at 443 K with excess of conc.  $\text{H}_2\text{SO}_4$ . State the role of conc.  $\text{H}_2\text{SO}_4$  in this reaction. Write chemical equation for the reaction.
9. Why homologous series of carbon compounds are so called? Write chemical formula of two consecutive members of a homologous series and state the part of these compounds that determines their (i) physical properties, and (ii) chemical properties.
10. Given below are some elements of the modern periodic table:  $4\text{Be}$ ,  $9\text{Fe}$ ,  $14\text{Si}$ ,  $19\text{K}$ ,  $20\text{Ca}$  (i) Select the element that has one electron in the outermost shell and write its electronic configuration. (ii) Select

two elements that belong to the same group. Give reason for your answer.(iii) Select two elements that belong to the same period. Which one of the two has bigger atomic size?

11. Write the number of periods the modern periodic table has. How do the valency and metallic character of elements vary on moving from left to right in a period? How do the valency and atomic size of elements vary down a group?

12. (a) Explain the process of regeneration in Planaria.  
(b) How is regeneration different from reproduction?

13. Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Explain how the transmission of such diseases be prevented?

14. Tabulate two distinguishing features between acquired traits and inherited traits with one example of each.

15. "The sex of a newborn child is a matter of chance and none of the parents may be considered responsible for it." Justify this statement with the help of flow chart showing determination of sex of a newborn.

16. Mention the types of mirrors used as (i) rear view mirrors, (ii) shaving mirrors. List two reasons to justify your answers in each case.

17. An object of height 6cm is placed perpendicular to the principal axis of a concave lens of focal length 5 cm. Use lens formula to determine the position, size and nature of the image if the distance of the object from the lens is 10 cm.

18. State the difference in colours of the sun observed during sunrise/sunset and noon. Give explanation for each.

19. (a) What is an ecosystem? List its two main components.  
(b) We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Explain.

20. (a) Define the term 'isomers'.  
(b) Draw two possible isomers of the compound with molecular formula  $C_3H_6O$  and write their names.  
(c) Give the electron dot structures of the above two compounds.

21. (a) List three distinguishing features between sexual and asexual types of reproduction.  
(b) Explain why variations are observed in the offsprings of sexually reproducing organisms?

22. (a) Identify A, B and C in the given diagram and write their functions.  
(b) Mention the role of gamete and zygote in sexually reproducing organisms.

23. (a) State the laws of refraction of light. Give an expression to relate the absolute refractive index of a medium with speed of light in vacuum.

(b) The refractive indices of water and glass with respect to air are  $\frac{4}{3}$  and  $\frac{3}{2}$  respectively. If the speed of light in glass is  $2 \times 10^8 \text{ms}^{-1}$ , find the speed of light in (i) air, (ii) water.

24. (a) A person cannot read newspaper placed nearer than 50 cm from his eyes. Name the defect of vision he is suffering from. Draw a ray diagram to illustrate this defect. List its two possible causes. Draw a ray diagram to show how this defect may be corrected using a lens of appropriate focal length.

(b) We see advertisements for eye donation on television or in newspapers. Write the importance of such advertisements.

## SECTION - B

25. A student takes 2 mL acetic acid in a dry test tube and adds a pinch of sodium hydrogen carbonate to it. He makes the following observations:

I. A colourless and odourless gas evolves with a brisk effervescence.

II. The gas turns lime water milky when passed through it.

III. The gas burns with an explosion when a burning splinter is brought near it.

IV. The gas extinguishes the burning splinter that is brought near it.

The correct observations are:

(A) I, II, and III

(B) II, III and IV

(C) III, IV and I

(D) IV, I and II

26. In an experiment to study the properties of acetic acid a student takes about 2 mL of acetic acid in a dry test tube. He adds about 2 mL of water to it and shakes the test tube well. He is likely to observe that:

(A) the acetic acid dissolves readily in water

(B) the solution becomes light orange

(C) water floats over the surface of acetic acid

(D) acetic acid floats over the surface of water

27. A student prepared 20% sodium hydroxide solution in a beaker containing water. The observations noted by him are given below.

I. Sodium hydroxide is in the form of pellets.

II. It dissolves in water readily.

III. The beaker appears cold when touched from outside.

IV. The red litmus paper turns blue when dipped into the solution.

The correct observations are:

(A) I, II, and III

(B) II, III and IV

(C) III, IV and I

(D) I, II and IV

28. Read the following statements:

I. When a red litmus paper is dipped into reaction mixture of a saponification reaction, it turns blue and the reaction is exothermic.

II. When a blue litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is exothermic.

III. When a red litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is endothermic.

IV. When a blue litmus paper is dipped into reaction mixture of a saponification reaction, its colour does not change and the reaction is endothermic.

Which of the above statements are correct:

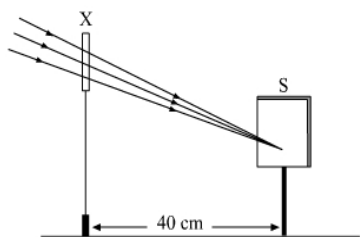
- (A) I, and II
- (B) II and III
- (C) III and IV
- (D) I and IV

29. Hard water required for an experiment is not available in a school laboratory. However, following salts are available in the laboratory. Select the salts which may be dissolved in water to make it hard for the experiment.

- (1) Calcium Sulphate
- (2) Sodium Sulphate
- (3) Calcium Chloride
- (4) Potassium Sulphate
- (5) Sodium Hydrogen Carbonate
- (6) Magnesium Chloride

- (A) 1, 2 and 4
- (B) 1, 3 and 6
- (C) 3, 5 and 6
- (D) 2, 4 and 5

30. A student focussed the image of a distant object using a device 'X' on a white screen 'S' as shown in the figure. If the distance of the screen from the device is 40 cm, select the correct statement about the device.



- (A) The device X is a convex lens of focal length 20 cm.
- (B) The device X is a concave mirror of focal length 40 cm.
- (C) The device X is a convex mirror of radius of curvature 40 cm.
- (D) The device X is a convex lens of focal length 40 cm.

31. A student obtained a sharp image of a burning candle, placed at the farther end of a laboratory table, on a screen using a concave mirror. For getting better value of focal length of the mirror, the subject teacher suggested him for focusing a well illuminated distant object. What should the student do?

- (A) He should move the mirror away from the screen.
- (B) He should move the mirror slightly towards the screen.
- (C) He should move the mirror as well as the screen towards the newly selected object.
- (D) He should move only the screen towards the newly selected object.

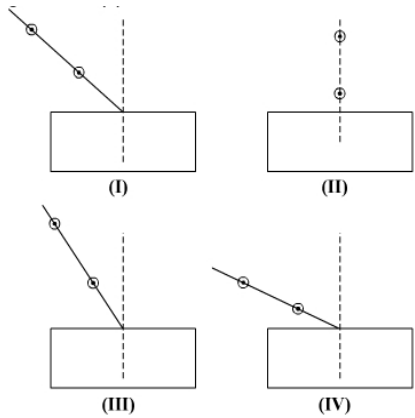
32. After tracing the path of rays of light through a glass slab for three different angles of incidence, a student measured the corresponding values angle of refraction  $r$  and angle of emergence  $e$  and recorded them in the table given below:

S. No.	$\angle i$	$\angle r$	$\angle e$
I	$30^\circ$	$20^\circ$	$31^\circ$
II	$40^\circ$	$25^\circ$	$40^\circ$
III	$50^\circ$	$31^\circ$	$49^\circ$

- (A) I and II
- (B) II and III

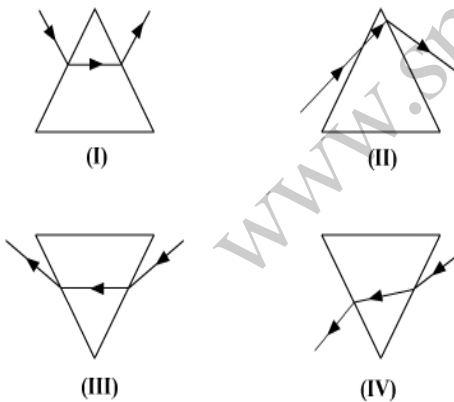
- (C) I and III
- (D) I, II and III

33. Select from the following the best set-up for tracing the path of a ray of light through a rectangular glass slab:



- (A) I
- (B) II
- (C) III
- (D) IV

34. 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.



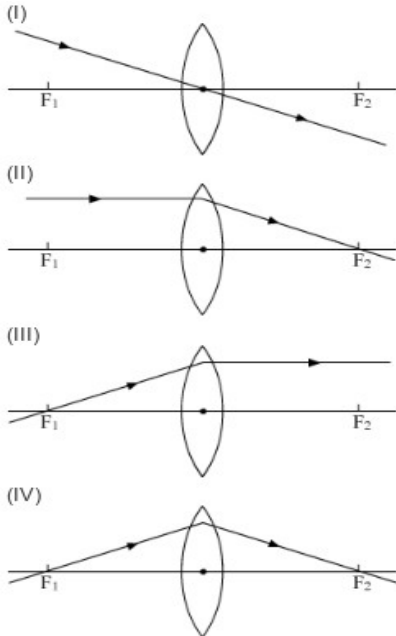
- (A) I
- (B) II
- (C) III
- (D) IV

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

- (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

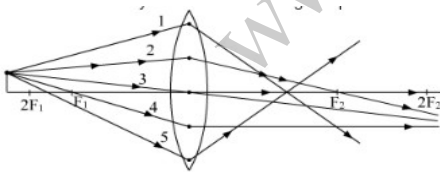
36. Study the following ray diagrams:



The diagrams showing the correct path of the ray after passing through the lens are:

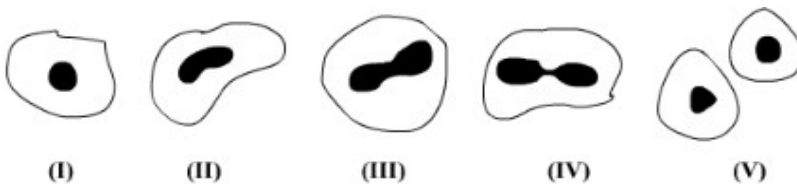
- (A) II and III only
- (B) I and II only
- (C) I, II and III
- (D) I, II and IV

37. 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 image formed by a convex lens:



- (A) 1, 2 and 3
- (B) 2, 3 and 4
- (C) 3, 4 and 5
- (D) 1, 2 and 4

38. A student after observing a slide showing different stages of binary fission in Amoeba draws the following diagrams. However these diagrams are not in proper sequence:



- (A) I, V, IV, III, II
- (B) I, III, IV, V, II
- (C) I, V, III, IV, II
- (D) I, II, III, IV, V

39. Select the correct statements for the process of budding in yeast:

- I. A bud arises from a particular region on a parent body.
- II. A parent cell divides into two daughter cells, here the parental identity is lost.
- III. Before detaching from the parent body a bud may form another bud.
- IV. A bud when detaches from the parent body grows into a new individual.

- (A) I, II and III
- (B) II, III and IV
- (C) III, IV and I
- (D) IV, I and II

40. Study the different conclusions drawn by students of a class on the basis of observations of preserved/available specimens of plants and animals.

- I. Potato and sweet potato are analogous organs in plants.
- II. Wings of insects and wings of birds are homologous organs in animals.
- III. Wings of insects and wings of bats are analogous organs in animals.
- IV. Thorns of citrus and tendrils of cucurbita are analogous organs in plants.

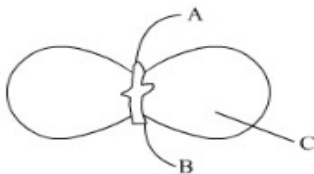
The correct conclusions are:

- (A) I, and II
- (B) II and IV
- (C) I and III
- (D) III and IV

41. You have potato, carrot, radish, sweet potato, tomato and ginger bought from the market in your jute bag. Identify two vegetables to represent the correct homologous structures.

- (A) Potato and tomato
- (B) Carrot and tomato
- (C) Potato and sweet potato
- (D) Carrot and radish

42. In the figure, the parts marked A, B and C are sequentially:



- (A) Plumule, Radicle and Cotyledon
- (B) Radicle, Plumule and Cotyledon
- (C) Plumule, Cotyledon and Radicle
- (D) Radicle, Cotyledon and Plumule