

Science - 824-EN - 2023 Question Paper with Solutions

Time Allowed :3 Hours

Maximum Marks :70

Total questions :35

General Instructions

Instruction:

- (i) First 15 minutes are allotted to students to read the question paper.
- (ii) The question paper is divided into two sections—Section (A) and Section (B).
- (iii) Section (A) and (B) are divided into three sub-sections: (a), (b), and (c).
- (iv) Questions in Section (A) are multiple choice type. Selecting the correct choice, fully colour the correct circle in the OMR sheet. Only blue or black ball point pen can be used.
- (v) 1 mark is allotted to each question of Section (A), which contains only multiple choice questions.
- (vi) Section (B) consists of descriptive questions.
- (vii) Marks allotted to each question are given on the right side of the question.
- (viii) It is necessary to answer all the questions of each sub-section of Section (B) altogether. Each sub-section should be started on a new page.
- (ix) All questions are compulsory.

1. The image formed by a concave mirror is real, inverted and of the same size as the object. The position of the object will be:

- (1) at the focus
- (2) between the focus and centre of curvature
- (3) at the centre of curvature
- (4) beyond the centre of curvature

2. On passing a ray of white light through a prism, the colour which has minimum deviation is:

- (1) green
- (2) yellow
- (3) red
- (4) violet

3. A concave lens is used:

- (1) as magnifying lens
- (2) in a car to see objects on rear
- (3) in spectacles for the correction of short sightedness
- (4) in simple cameras

4. The amount of light entering in the eye is controlled by:

- (1) ciliary muscles
- (2) eye lens
- (3) pupil
- (4) cornea

5. The correct formula for electric power in an electric circuit is:

- (1) $P = iR$
- (2) $P = i^2 R$
- (3) $P = \frac{V^2}{R}$
- (4) $P = iR^2$

6. The magnetic field inside a long, straight current carrying solenoid:

- (1) is zero
- (2) is same at all points
- (3) decreases as we move towards its ends

(4) increases as we move towards its ends

7. The frequency of alternating current (a.c.) supply in India is:

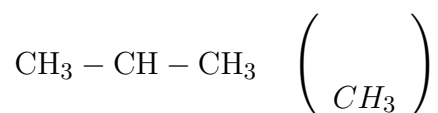
- (1) Zero Hertz
- (2) 50 Hertz
- (3) 60 Hertz
- (4) 100 Hertz

8. Arsenic element is:

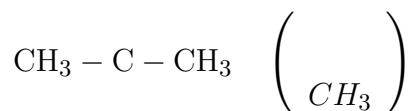
- (1) Metal
- (2) Non-metal
- (3) Metalloid
- (4) Inert

9. Propane is:

- (1) $\text{CH}_3 - \text{CH}_2 - \text{CH}_3$
- (2)

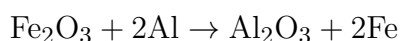


- (3)



- (4) $(\text{CH}_3)_2\text{CH} - \text{CH}_2 - \text{CH}_3$

10. Which type of reaction is the following?



- (1) Addition reaction
- (2) Double displacement reaction
- (3) Dissociation reaction
- (4) Displacement reaction

11. Moving towards right in Modern Periodic Table:

- (1) Atomic radius and metallic nature increases
- (2) Atomic radius and metallic nature decreases
- (3) Atomic radius decreases and metallic nature increases

(4) Atomic radius increases and metallic nature decreases

12. Match the chemical substances given in Column A with Column B:

Column A

Column B

- | | |
|-----------------|----------------------------------|
| a. Acetic acid | i. In the formation of soap |
| b. Ethanol | ii. In making denatured spirit |
| c. Caustic soda | iii. In the formation of vinegar |
| d. Detergents | iv. In cleaning clothes |

The correct matching is:

- (1) a - iii, b - iv, c - i, d - ii
- (2) a - iii, b - i, c - ii, d - iv
- (3) a - ii, b - iii, c - i, d - iv
- (4) a - iii, b - ii, c - i, d - iv

13. pH value of pure water at 25°C temperature is:

- (1) Less than 7 and more than 0
- (2) More than 7 and less than 14
- (3) 0
- (4) 7

14. Which is not synthesized during the process of photosynthesis?

- (1) Oxygen
- (2) CO₂
- (3) Water
- (4) Glucose

16. Number of chambers in human heart is:

- (1) 4
- (2) 2
- (3) 6
- (4) 8

17. Regeneration occurs in:

- (1) Planaria, but not in Hydra
- (2) Hydra, but not in Planaria
- (3) Paramecium, but not in Hydra

(4) Hydra and Planaria

18. Vegetative reproduction through leaves occurs in:

(1) Bryophyllum

(2) Potato

(3) Gram

(4) Rose

19. Darwin is famous for:

(1) Origin of life

(2) Natural Selection theory

(3) Genetics

(4) Biodiversity

20. Which country is called ‘country of winds’?

(1) Denmark

(2) India

(3) China

(4) Germany

21. The radius of curvature of a concave mirror is 40 cm. An object is placed in front of it at a distance of 15 cm. Find the position of its image and draw its ray diagram.

22. Draw the ray diagrams to show the formation of images when:

(a) Object is placed in front of a converging lens between its focus (F) and optical centre (O)

(b) Object is placed between focus (F) and twice the distance of focus (2F)

State the nature of the images.

23. In the circuit diagram given below, five resistances of $10\ \Omega$, $40\ \Omega$, $30\ \Omega$, $20\ \Omega$, and $60\ \Omega$ are connected as shown to a 12 volt battery.

Calculate:

(a) Total (equivalent) resistance in the circuit.

(b) Total current flowing in the circuit.

OR

Draw a labelled circuit diagram of an electric generator and explain its principle and working.

25. Write IUPAC name of the following compounds:

- (a) Neopentane
- (b) Secondary butyl alcohol
- (c) Trichloroacetic acid
- (d) Acetylene

26. How many groups and periods are present in the Modern Periodic Table? In which groups are alkaline metals and inert elements placed in this periodic table?

27. What happens when (write only balanced chemical equation):

- (a) CO_2 gas is passed in lime water for a long time
- (b) Dry lime reacts with dry Cl_2 gas
- (c) Gypsum is heated
- (d) Sodium metal reacts with water

28. Write short notes on the following:

- (a) Roasting
- (b) Double Decomposition
- (c) Corrosion

28. Comment upon nuclear and oceanic energy.

29. Explain homologous and analogous organs.

30. Give an account on photosynthesis.

31. Describe the female reproductive system of humans.

32. Write an essay on sustainable management of natural resources.