

E-5-A

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2305-A

SCIENCE

(Physics, Chemistry and Life Science)

1. Using the ray diagram, find the nature, position and size of image formed by a convex lens, when object is placed :

- (a) At infinity
- (b) Between the centre of curvature and principal focus
- (c) Beyond the centre of curvature

Or

- (a) Define magnification and derive the relation $m = h'/h$
- (b) The magnification produced by a plane mirror is +1. What does this signify ?

2. Explain the dispersion of light through a glass prism.

Or

Why does the sky appear dark instead of blue to an astronomer!

3. Define potential difference and derive the relation $v = w/q$. Give its units.

OR

How will you connect three resistances each of 6 ohms so that the resultant resistance would be 9 ohms and 4 ohms ?

4. Explain the nature of magnetic field produced due to current in a circular loop of wire.

OR

Explain the working of an electric motor and give its applications.

5. (i) Explain the term refraction of light.

(ii) What are the limitations of the energy that can be obtained from the oceans ?

(iii) The light enters from air to glass having refractive index 1.5. What is the speed of light in the glass ? (The speed of light in air is 3×10^8 m/s)

(Multiple Choice Questions)

6. (i) Some persons cannot see the objects from long distances due to the defect called :

(A) Myopia

(B) Hypermetropia

(C) Presbyopia

(D) Astigmatism

(ii) Which of the following have lowest resistivity ?

(A) Metals

(B) Non-metals

(C) Metalloids

(D) Insulators

(iii) The resistance of a straight conductor is independent of :

(A) Temperature

(B) Material

(C) Cross-sectional area

(D) Shape of cross-section

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(iv) The main source of energy on the earth is :

(A) Coal

(B) Nuclear energy

(C) Sun

(D) Biegas

Section-B

(CHEMISTRY)

(Long Answer Type Questions)

7. How and under what conditions does ethanoic acid react with ethanol and sodium carbonate ?

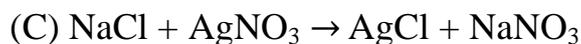
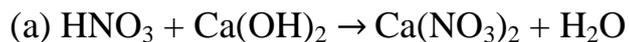
Or

Explain the versatile nature of carbon. Why it forms only covalent compounds ?

8. What are decomposition reactions ? Give three examples where heat, light and electricity is involved.

OR

Balance the following chemical equations :



9. What are the achievements of Mendeleev's periodic table? What was the basis of classification in it ?

Or

Define atomic radius. How do the atomic radii of elements change in a group ?

10. How does zinc is extracted from its sulphide ore ? Give the chemical reactions that take place during the process. <https://www.jkboseonline.com>

Or

How do metals react with non-metals ? Write an example.

(Very Short Answer Type Questions)

11. (i) How can pH change causes the tooth decay ?

(ii) Why does an aqueous solution of an acid conduct electricity ?

(iii) Why gold and silver are used to make jewellery ?

(Multiple Choice Questions)

12. (i) Organic acids have the functional group :

(A) –OH

(B) –COOH

(C) –CHO

(D) CO

(ii) Vinegar is :

(A) 25% acetic acid

(B) 6.8% acetic acid

(C) Pure acetic acid

(D) 6.8 oxylic acid

(iii) Which of the following acids is used as a component of baking soda ?

- (A) Oxalic acid
- (B) Acetic acid
- (C) Carbonic acid
- (D) Tartaric acid

(iv) Which one of the following is an exothermic reaction ?

- (A) $C + O_2 \rightarrow CO_2$
- (B) $N_2 + O_2 \rightarrow 2NO$
- (C) $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$
- (D) $N_2 + 3H_2 \rightarrow 2NH_3$

Section-C

(LIFE SCIENCE)

(Long Answer Type Questions)

13. Describe the various pathways in which glucose is oxidised to provide energy in the various organisms.

Or

What are the components of the transport system in human beings ? Give the function of these components.

(Short Answer Type Questions)

14. What is asexual reproduction ? How do the following animals reproduce asexually ?

- (a) Plasmodium
- (b) Hydra
- (c) Planaria
- (d) Bryophyllum

Or

Define reproductive health. What happens when the egg is not fertilized ?

15. Write down at least three characteristics of food webs.

Or

How can you help in reducing the problem of waste disposal ? Give any two methods.

16. Why should we need to conserve forests and wildlife ?

Or

What are the factors that have effected the soil fertility and degraded it ?

(Very Short Answer Type Questions)

17. (i) What happens at the synapses between the two neurons ?

(ii) Write a short note on Speciation.

(iii) Why does the menstrual cycle occur in human females ?

(Multiple Choice Questions)

18. (i) Thyroxine is produced by :

(A) Pancreas

(B) Pituitary gland

(C) Adrenal glands

(D) Thyroid gland

(ii) In a monohybrid cross, we get a genotypic ratio of :

(A) 1:2:1

(B) 1:1: 2

(C) 3 : 1

(D) 2 : 1:2

(iii) Which of the following inhibits growth in plants ?

(A) Auxins

(B) Gibberellins

(C) Abscisic acid

(D) Cytokinins

(iv) Darwin's theory does not include :

(A) Natural selection

(B) Survival of the fittest

(C) Evolution through inheritance

(D) Struggle for existence