

**Maharashtra State Board
Class X Science and Technology
Board Paper - 2013**

Time: 2 1/2 hrs

Max. Marks: 60

Note:

- (i) Use the same answer book for Section A and Section B.
- (ii) Draw well-labelled diagrams wherever necessary.
- (iii) All questions are compulsory.
- (iv) Students should write the answers of questions in sequence.

SECTION A

1. (A) Fill in the blanks: [2]

- (1) The chemical formula for rust is..... .
- (2) The law used by Newlands to arrange elements is known as..... .

(B) State whether the following statements are true or false: [2]

- (1) The pH of rainwater is 7.
- (2) The SI unit of charge is volt.

(C) Rewrite the following table so as to match the second and third columns with the first column: [3]

Column I	Column II	Column III
1. Dispersion	Long-sightedness	Twinkling of stars
2. Refraction	Splitting of white light into component colours	Convex lens
3. Hypermetropia	Change in the direction of the ray of light due to change in medium	Spectrum of seven colours

2. Answer the following questions: [3 × 2 = 6]

- (1) Distinguish between Conductors and Insulators.
- (2) Why should the wires carrying electricity not be touched barefooted?
- (3) Calculate the focal length of a corrective lens having power +2.5 D.

3. Answer the following questions (any four): **[4 × 3 = 12]**

(1) The atomic masses of three elements A, B and C having similar chemical properties are 7, 23 and 39, respectively.

(a) Calculate the average atomic mass of elements A and C.

(b) Compare the average atomic mass with atomic mass of B.

(c) What could the elements A, B and C be?

(2) When the substance 'A' is added to a solution of BaSO_4 , a yellow precipitate is formed.

(a) What do you think substance A is likely to be?

(b) Name the precipitate.

(c) Which type of reaction is this?

(3) A person has sour taste in the mouth and a burning sensation of the stomach.

(a) What is he suffering from?

(b) Why does it happen?

(c) What substance is used as a remedy?

(4) Write any *three* properties of magnetic lines of force.

(5) Explain how the formation of a rainbow occurs.

4. Answer the following (any one): **[5]**

(1) What is myopia? Explain *two* possible reasons of myopia. How can it be corrected? Explain with a suitable diagram.

(2) Find the expression for resistors connected in series. Write any *two* characteristics of a series combination of resistors.

SECTION B

5. (A) Fill in the blanks: [2]

- (1) Dominant character masks the character.
- (2) artery takes the blood to the lungs for oxygenation.

(B) State whether the following statements are true or false: [3]

- (1) Roots of plants grow towards light.
- (2) Hormones secreted by endocrine glands are directly released into the bloodstream.
- (3) If the X chromosome is inherited from the mother and the Y chromosome from the father, then the offspring will be a male.

(C) Write the structural formula of Methane. [1]

(D) Name the following: [1]

Metal which forms an amphoteric oxide.

6. Answer the following sub-questions: [3 × 2 = 6]

(1) 'A' is an element having four electrons in its outermost orbit. An allotrope 'B' of this element is used as a dry lubricant in machinery and in pencil leads. So

- (i) Write the name of element 'A' and its allotropes.
- (ii) State whether 'B' is a good conductor or non-conductor of electricity.

(2) 'E' is an element which reacts with oxygen to form an oxide E_2O . An aqueous solution of E_2O turns red litmus blue, so

- (i) What is the nature of oxide E_2O ?
- (ii) Write the name of element 'E'.

(3) Write two points of differences between arteries and veins.

7. Answer the following questions (any four): [4 × 3 = 12]

(1) Write any *three* differences between metals and non-metals with respect to their physical properties.

(2) Define:

- (i) Saturated hydrocarbon
- (ii) Unsaturated hydrocarbon
- (iii) Catenation

(3) Write the names and functions of *three* parts of the human nervous system in which it is divided.

(4) What is meant by sexual reproduction? Name its two main processes.

(5) Name any *three* parts of the female reproductive system in human beings. Write *one* function of each.

8. Write the answer of any *one* question given below: [5]

(1) Write the names of different parts of the human digestive system and explain the functions of any *three* parts.

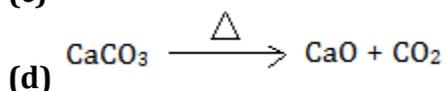
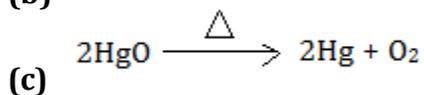
(2) Answer the following:

- (a) Draw a diagram of DNA showing genes.
- (b) What are the peculiarities of its structure?

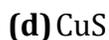
Experiment - based MCQs

Max. Marks: 20

1. is a combination reaction.



2. Reddish brown deposit of is formed on iron nails kept in a solution of copper sulphate.



3. The litmus paper or the litmus solution is obtained from plants.

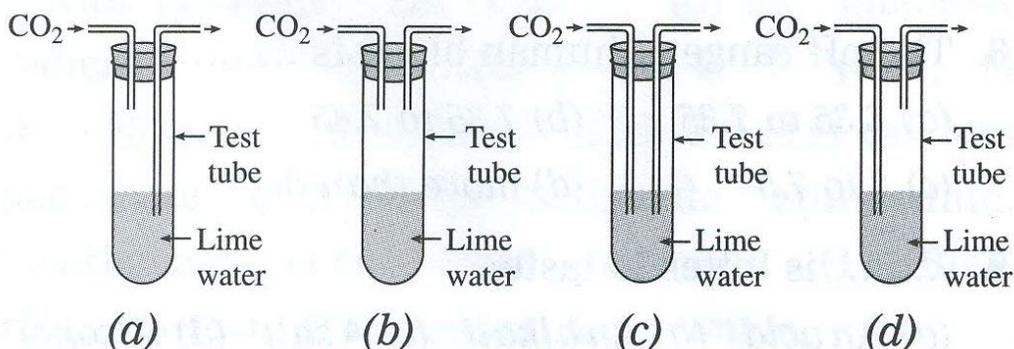
(a) Moss

(b) Rose

(c) *Hibiscus*

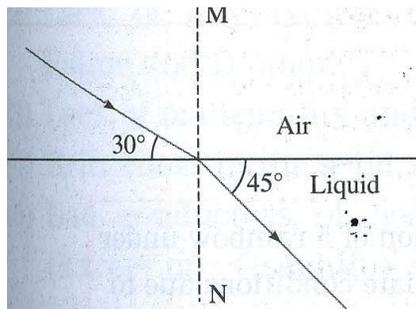
(d) Lichen

4. is the correct set up to pass CO_2 through limewater.



5. If there are 8 divisions between the 0 A mark and 0.4 A mark of an ammeter, then its least count is
- (a) 0.050 A
(b) 0.025 A
(c) 0.040 A
(d) 0.020 A
6. The equivalent resistance of the parallel combination of two resistors of $5\ \Omega$ and $10\ \Omega$ is
- (a) $15\ \Omega$
(b) $\frac{10}{3}\ \Omega$
(c) $\frac{3}{10}\ \Omega$
(d) $5\ \Omega$
7. When a resistor of $2\ \Omega$ is connected to a cell of negligible internal resistance, the current through a $2\ \Omega$ resistor is 1 A. If another resistor of $8\ \Omega$ is connected in series with the first one, then the current through the $2\ \Omega$ resistor will be about
- (a) 1 A
(b) 0.25 A
(c) 0.20 A
(d) 10 A
8. The image formed by a concave lens is always
- (a) Real, inverted and diminished
(b) Real, inverted and magnified
(c) Virtual, erect and magnified
(d) Virtual, erect and diminished
9. The power of a concave lens of focal length 25 cm is
- (a) +4.0 D
(b) +5.0 D
(c) -4.0 D
(d) -5.0 D

10. The figure shows the path of a ray of light from air into liquid. What is the refractive index of the liquid?



- (a) $\frac{\sin 45^\circ}{\sin 60^\circ}$ (b) $\frac{\sin 60^\circ}{\sin 45^\circ}$ (c) $\frac{\sin 45^\circ}{\sin 30^\circ}$ (d) $\frac{\sin 30^\circ}{\sin 45^\circ}$

11. The speed of light in a transparent medium having absolute refractive index 1.25 is

- (a) 1.25×10^8 m/s
 (b) 2.4×10^8 m/s
 (c) 3.0×10^8 m/s
 (d) 1.5×10^8 m/s

12. A solution of $\text{Al}_2(\text{SO}_4)_3$ in water is

- (a) Blue
 (b) Pink
 (c) Green
 (d) Colourless

13. 2 ml of ethanoic acid was taken in each of the test tubes A, B and C, and 2 ml, 4 ml and 6 ml of water was added respectively to them. A clear solution is obtained in

- (a) Test tube A
 (b) Test tube B
 (c) Test tube C
 (d) All the test tubes

14. To observe stomata in a dicot leaf, we must prepare a slide by taking

- (a) The crushed leaf
 (b) The upper epidermis of the leaf
 (c) The lower epidermis of the leaf
 (d) The central part of the leaf

15. A student soaked 5 g of raisins in beaker A containing 25 ml of ice cold water and another 5 g of raisins in beaker B containing 25 ml of tap water at room temperature. After one hour, the student observed that
- (a) The water absorbed by raisins in beaker A is more than the water absorbed by raisins in beaker B.
 - (b) The water absorbed by raisins in beaker B is more than the water absorbed by raisins in beaker A.
 - (c) The amount of water absorbed by raisins in both the beakers is the same.
 - (d) No water was observed by raisins in any of the beakers.
16. stain will clearly show *Amoeba* and *Paramecium* in a drop of water taken on a slide and observed under a microscope.
- (a) Methylene blue
 - (b) Iodine
 - (c) Safranin
 - (d) Eosin
17. Suresh observed a slide of *Amoeba* with elongated nuclei. It would represent
- (a) Budding
 - (b) Fragmentation
 - (c) Binary fission
 - (d) Regeneration
18. Riya prepared limewater and used it the next month to show that CO_2 is produced during respiration. Which of the following is true?
- (i) White precipitate will be formed.
 - (ii) White precipitate will not be formed.
 - (iii) Limewater should be fresh.
 - (iv) Limewater can be used any time.
- (a) (ii) is correct.
 - (b) (ii) and (iv) are correct.
 - (c) (i) and (iv) are correct.
 - (d) (ii) and (iii) are correct.
19. In the experiment to test the presence of starch, the leaf is boiled in alcohol using a water bath because
- (a) Alcohol softens the leaf
 - (b) Alcohol prevents iodine from entering the leaf
 - (c) Alcohol allows iodine to enter the leaf
 - (d) Alcohol dissolves the chlorophyll

20. The reaction of iron nails with copper sulphate solution is a reaction.

- (a) Combination
- (b) Decomposition
- (c) Displacement
- (d) Double displacement