X SCIENCE (THEORY)

BLUE PRINT II

Form of Questions / Unit	VSA (1 Mark)	SA - I (2 Marks)	SA - II (3 Marks)	LA (5 Marks)	Total
Chemical Substances	3(3)	4(2)	6(2)	5(1)	18(8)
World of Living	2(2)	6(3)	3(1)	5(1)	16(7)
Effects of current	1(1)	4(2)	-	5(1)	10(4)
Light	2(2)	-	6(2)	-	8(4)
Natural Resources	1(1)	4(2)	3(1)	-	8(4)
Total	**9(9)**	**18(9)**	**18(6)**	**15(3)**	**60(27)**

SAMPLE QUESTION PAPER II

X - SCIENCE (Theory)

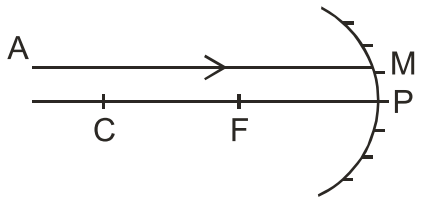
Time:2½ Hours **Max. Marks: 60**

General Instructions

1. The question paper comprises of two sections A and B. You have to attempt both the sections.
2. All questions are compulsory.
3. There is no overall choice. However, internal choice has been provided in all the three questions of five marks category. Only one option in such questions is to be attempted.
4. All questions of section A and all questions of section B to be attempted separately.
5. Questions 1 to 6 in section A and 19 to 21 in section B are very short answer questions. These carry one mark each.
6. Questions 7 to 12 in section A and 22 to 24 in section B are short answer type questions and carry two marks each.
7. Questions 13 to 16 in section A and 25 to 26 in section B are also short answer type questions and carry three marks each.
8. Questions 17 and 18 in section A and question 27 in section B are long answer type questions and carry five marks each.

Section A

1. A ray of light AM is incident on a spherical mirror as shown in the diagram.



Redraw the diagram on the answer sheet and show the path of reflected ray.

1. A metal M belongs to 13^{th} group in the modern periodic table. Write the valency of the metal.
2. The ciliary muscles of a normal eye are in their (i) most relaxed (ii) most contracted state. In which of the two cases is the focal length of the eye-lens more?
3. Tap water conducts electricity whereas distilled water does not. Why?
4. An electric geyser has the ratings 2000W, 220V marked on it. What should be the minimum rating, in whole number of a fuse wire, that may be required for safe use with this geyser?
5. Kerosene burns with a sooty flame. Is it a saturated or an un saturated compound?
6. Two metallic wires A and B of the same material are connected in parallel. Wire A has length *l* and radius r, wire B has a length 2*l* and radius 2r. Calculate the ratio of the equivalent resistance in parallel combination and the resistance of wire A.
7. A student performs an experiment to study the magnetic effect of current around a current

carrying straight conductor. He reports that

(i) for a given battery, the degree of deflection of a N – pole decreases when the compass is kept at a point farther away from the conductor.

(ii) the direction of deflection of the north pole of a compass needle kept at a given point near the conductor remains unaffected even when the terminals of the same battery sending current in the wire are inter changed.

Which of the above observations of the student appears to be wrong and why?

8. A housewife wanted her house to be whitewashed. She bought 10kg of quick lime from the market and added it to 30 litres of water. On adding lime to water she noticed that the water appeared to be boiling even when it was not being heated. Give reason for her observation. Write the corresponding chemical equation and name the product formed.

9. Write the electron- dot structure for sodium and chlorine atoms. How do these form a chemical bond? Name the type of bond so formed. Why does a compound so formed have high melting point?

10. Why are many thermal power plants set up near coal or oil fields?

11. How is charcoal obtained from wood? Write two advantages of using charcoal as a fuel over wood?

12. Two carbon compounds A and B have the molecular formula C_3H_8 and C_3H_6 respectively. Which one of the two is most likely to show addition reaction? Justify your answer. Explain with the help of a chemical equation, how an addition reaction is useful in vegetable ghee industry.

13. A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram.

A student makes the following statements about the spectrum observed on the screen.

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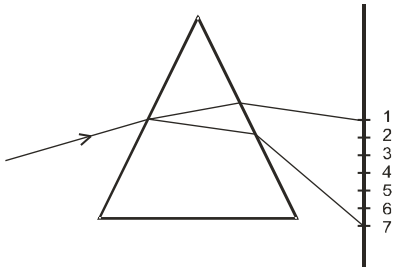


(a) The colours at positions marked 3 and 5 are similar to the colour of the sky and the colour of gold metal respectively.

Is the above statement made by the student correct or incorrect? Justify.

(b) Which two positions correspond closely to the colour of

(i) a brinjal

(ii) 'danger' or stop signal lights?

15. Baking soda is used in small amount in making bread and cake. It helps to make these soft and spongy. An aqueous solution of baking soda turns red litmus blue.

It is also used in soda acid fire extinguisher.

Use this information to answer the following questions:-

(i) How does Baking Soda help to make cakes and bread soft and spongy?

(ii) How does it help in extinguishing fire?

(iii) Is the pH value of baking soda solution lower than or higher than 7 ?

16. (i) A concave mirror produces three times enlarged image of an object placed at 10 cm in front of it. Calculate the focal length of the mirror.

(ii) Show the formation of the image with the help of a ray diagram when the object is placed 6 cm away from the pole of the mirror.

17. (a) How does the atomic radius change as you go

(i) from left to right in a period?

(ii) down a group in the periodic table

(b) Two elements X and Y have atomic numbers 12 and 16 respectively. Write the electronic configuration for these elements. To which period of the modern periodic table do these two elements belong? What type of bond will be formed between them and why?

Or

(a) How would the tendency to lose electrons change as you go

(i) from left to right across a period

(ii) down a group

(b) An element X (2, 8,2) combines separately with $(NO_3)^{1-}$, $(SO_4)^{2-}$, and $(PO_4)^{3-}$ radicals. Write the formulae of the three compounds so formed. To which group of the periodic table does the element 'X' belong? Will it form covalent or ionic compound? Why?

18. (a) The electric power consumed by a device may be calculated by using either of the two expressions $P = 1^2R$ or $P = \frac{V^2}{R}$. The first expression indicates that it is

directly proportional to R whereas the second expression indicates inverse proportionality. How can the seemingly different dependence of P on R in these expressions be explained?

(b) (i) A 100 W electric bulb is connected to 220 V mains power supply. Calculate the strength of the electric current passing through the bulb. (ii) If the same bulb is taken to U.S.A where the main power supply is 110 V, how much electric current will pass through the bulb when connected to mains?

OR

Explain the meaning of the word 'electromagnetic' and 'induction' in the termelectromagnetic induction. On what factors does the value of induced current produced in a circuit depend? Name and state the rule used for determination of direction of induced current. State one practical application of this phenomenon in every day life.

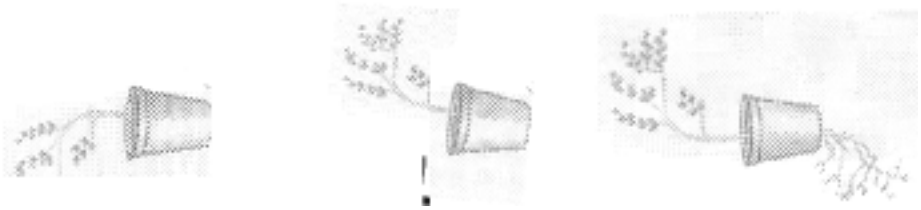
SECTION – B

Q.19 What will be the impact on ecosystems if Bacteria , fungi/microorganism are remove from the environment ? 1

Q.20 Why is sexual reproduction considered to be superior to asexual reproduction is terms of evolution? 1

Q.21 Name one organ where growth hormone is synthesized in case of plants and man. 1

Q.22 The given experimental set up establishes the response of different plant parts towards gravity.



a) Give the scientific term used for such response/movement. 1

b) How is shoot response different from root response/movement. 1

Q.23 Name the parts of brain which control following activities.

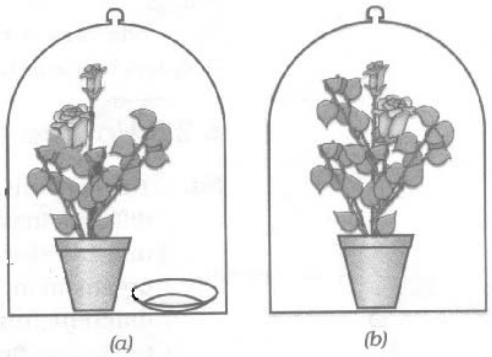
Blood Pressure

Riding Bicycle

Hearing

Centre associated with hunger ½ x 4 = 2

Q.24 Given below is the experimental set up to establish that one of the atmospheric gases is essential for photosynthesis is plants.

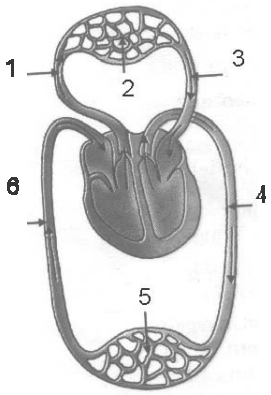


a. Name the atmospheric gas which is essential for photosynthesis . 2

b. What is kept is watch glass in figure 'a' and why?

Q.25 Mrs. Joshi is a house wife and wants to contribute for conservation of natural resources. List any six activities that she can do on her own. 3

Q.26



(i) Label any 4 parts in the above diagram.

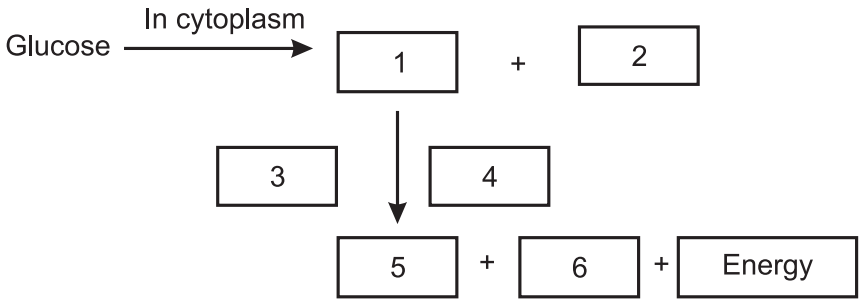
(ii) What are the two functions represented in this diagram?

3

Q.27 Plants absorb water from the soil. How does this water reach the tree tops? Explain in detail.

OR

Complete the glucose breakdown pathway in case of aerobic respiration by filling the blanks.



6×½ =3

a) Name the molecule in the cell which stores the energy produced at the end of the path way. ½

b) Why do we get cramps during sudden muscular activity? ½+½

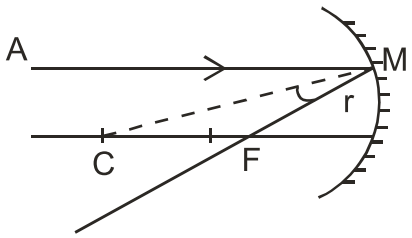
MARKING SCHEME

SAMPLE QUESTION PAPER II

X SCIENCE (THEORY)

Q.No.	Value Point	Marks

1.



2. The valency of the metal is 3. 1

3. In the first case. 1

4. Tap water contains dissolved salts and minerals which ionise in water and hence conducts electricity. Distilled water is a covalent compound so it does not conduct electricity. 1

5. 10 A 1

6. Unsaturated 1

7.

$$R = \rho \cdot \frac{\ell}{A}$$

$$R_A = \rho \cdot \frac{\ell}{\pi r^2}$$

$$R_B = \rho \cdot \frac{2\ell}{\pi(2r)^2} = \frac{\rho.2\ell}{4\pi r^2} = \frac{\rho.\ell}{2\pi r^2}$$

$$\frac{1}{R_p} = \frac{1}{R_A} + \frac{1}{R_B} = \frac{\pi r^2}{\rho\ell} + \frac{2\pi r^2}{\rho\ell} = \frac{3\pi r^2}{\rho\ell}$$

$$Rp = \frac{\rho.\ell}{3\pi r^2}$$

$$\frac{R_P}{R_A} = \frac{1}{3} = 1:3$$

8.

- Observation (ii) is wrong. 1
- When the direction of flow of current is changed, the direction of the magnetic field and hence the direction of force also changes. 1

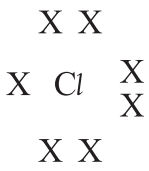
9. The reaction of lime with water is an exothermic reaction in which lot of heat is evolved. 1

$CaO + H_2O \longrightarrow Ca(OH)_2$

1

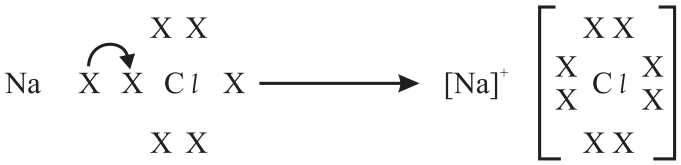
$Ca(OH)_2$ is called slaked lime or calcium hydroxide

10. Na



½

Sodium atom loses one electron to attain octet configuration and forms sodium ion. Chlorine atom has 7 electrons in the outermost shell, so it gains the electron lost by the sodium atom to form the chloride ion. The two oppositely charged ions are held together by strong electrostatic force of attraction to form the ionic bond. 1



Ionic compounds have high melting points because a considerable amount of energy is required to break the strong inter ionic attractions. ½

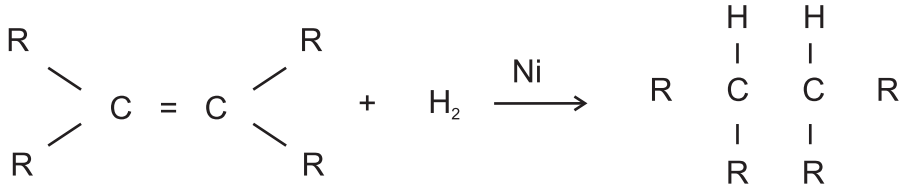
11. Coal or Petroleum is required to heat water to produce steam for running the turbines in thermal power plants. Cost of transportation is reduced if the thermal power plants are located near coal or oil fields. 2

12. Charcoal is obtained by burning wood in a limited supply of oxygen 1

(i) combus.tion of charcoal is comparatively smokeless

(ii) It has a higher heat generation efficiency 2 x ½= 1

13. C_3H_6 will show addition reaction. C_3H_6 is an unsaturated compound with a double bond. Vegetable oils have long unsaturated carbon chains which on addition of hydrogen in the presence of catalyst Nickel, change in to saturated carbon chains. This is called hydrogenation of oils.2



14. (a) Incorrect. The student is stating the nature of colours in reverse order. 1

(b) (i) Colour marked 7 1

(ii) Colour marked 1

15. (i) On heating, baking soda gives out CO_2 which makes cakes and bread rise up, so they become soft and spongy. 1

(ii) CO_2 being heavier than air settles down and forms a layer between the burning substance and the air, thus cutting off the supply of oxygen. 1

(iii) Its pH value is greater than 7. 1

16. (i) ½

$$\frac{1}{v}=\frac{1}{u}=\frac{1}{f}$$ ½

$$\frac{-v}{-u}=3$$

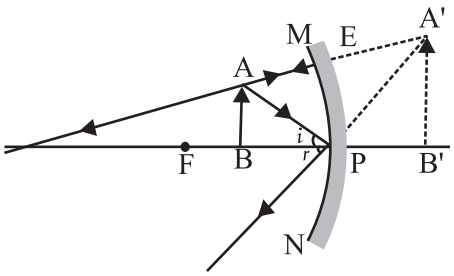
$$\frac{1}{-30}+\frac{1}{-10}=\frac{1}{f}$$

$$\frac{-1-30}{30}=\frac{1}{f}$$

$$\frac{-4}{30}=\frac{1}{f}$$

$$f=\frac{30}{4}=\frac{-15}{2}\text{cm}=7.5\text{cm}$$

(ii)



17. (a) (i) Atomic radius decreases 1

(ii) Atomic radius increases 1

(b) Atomic number

X, Z= 12 2, 8, 2

Y, Z = 16 2, 8, 6 1

They belong to the third period.

They will form ionic bond because X is a metal and Y is a non – metal. X loses 2 electrons which will be gained by Y. 2

OR

(a) (i) Tendency to lose electrons decreases 1

(ii) increases.

(b) $X_3(PO_4)_2$ ½

$X(NO_3)_2$ ½

$X\,SO_4$ ½

X belongs to Group II in the periodic table. ½

It will form ionic compounds because it will readily lose 2 electrons. 1

18. (a) Both the expressions are correct. In the first case, I remains constant whereas the second expression is true when V remains constant. 2

(b) 1

(i) $P = Vx1$

$I = \frac{P}{V} = \frac{100W}{220V} = \frac{10}{22}A$ 1

$R = \frac{V}{I} = \frac{220V}{10/_{22}A} = \frac{220x22}{10}\Omega$

$= 484\Omega$

(ii) $I = \frac{V}{R} = \frac{110V}{484\Omega} = \frac{110}{484}A$ 1

OR

(i) Meaning of the terms 1

(ii) Rate of change of magnetic flux 1

(iii) Fleming's Right Hand Rule 1

(iv) Statement of the rule 1

(v) Electric Generator 1

SECTION -B

19. Complex organic molecules will not breakdown in to simple inorganic substances, Preventing replenishment of soil. ½+½

20. Sexual mode of reproduction is a source of variation (in a population of organisms) which ensures survival of the species. ½+½

21. Shoot tip in plants (or any other appropriate example), pituitary gland (anterior) in man. ½+½

22. a) Geotropism 1

b) Root shows positive while shoot shows negative geotropic movement. ½+½

23. a) Hind brain

b) Hind brain (cerebellum)

c) Fore brain

d) Fore brain ½×4=2

24. a) CO_2 – Carbon dioxide. ½

b) KOH ½

it absorbs CO_2 to create an atmosphere which is devoid of CO_2. (½ + ½)

25. 1) Using solar cooker

2) Collecting waste separately

3) Using public transport

4) Using CFL

5) Avoid using lift or AC

6) Getting leaking taps repaired immediately

7) Use of pressure cooker

8) Switching off engine at traffic light (any other suitable examples). ½×6=3

26. (i) a) Pulmonary artery to lungs

b) Lung capillaries

c) Pulmonary vein from lungs

d) Aorta to body

e) Capillaries in body organs

f) Venacava from body.

(ii) Transport of oxygen and carbon dioxide

Exchange of oxygen and carbon dioxide

27. Xylem (vessels) of roots, stems and leaves are interconnected to form a continuous column. Roots also take up mineral salts actively, water moves in as a result creating pressure - the root pressure that pushes the water up. Stomatal transpiration creates suction force, pulling up the water from root xylem / transpiration pull. 1x5 =5

OR

27. 1) Pyruvate (3 carbon molecules)

2) Energy

3) Presence of oxygen

4) In Mitochondria

5) Carbon dioxide

6) Water ½×6 = 3

a) ATP 1

b) Lactic acid accumulation, in the absence of oxygen(anaerobic respiration) ½ +½