No. of Printed Pages : 10 Set-A *Roll No. .....*

PRE BOARD-I, 2023-24 MG-220

SCIENCE

Time : 3 hrs.] Class X [M.M. : 80

General Instructions—

(i) This question paper consists of 39 questions in 5 sections.

(ii) Section A consists of 20 objective type questions carrying one mark each.

(iii) Section B consists of 6 very short questions carrying two marks each. Answer to these questions should be in the range of 30-50 words.

(iv) Section C consists of 7 short answer type questions. These should be in the range of 50-80 words. These carry 3 marks each.

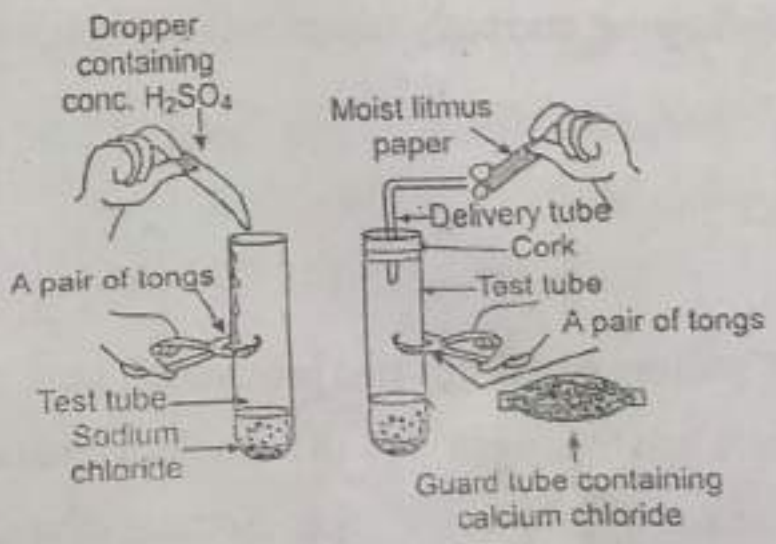
(v) Section D consists of 3 long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80-120 words.

(vi) Section E consists of 3 source-based/case based units of Assessment of 4 marks each with sub-parts.

(vii) All questions are compulsory. However an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

SECTION-A

1. The change in colour of the moist litmus paper in the given set up is due to :



P. T. O.

(i) Presence of acid
(ii) Presence of base
(iii) Presence of $H^+(aq)$ in the solutions
(iv) Presence of Litmus which acts as an indicator

(a) (i) and (ii)
(b) only (ii)
(c) only (iii)
(d) only (iv)

2. Calcium oxide reacts vigorously with water to produce slaked lime.

$$CaO(s) + H_2O(l) \longrightarrow Ca(OH)_2(aq)$$

The reaction can be classified as :

(A) Combination reaction
(B) Exothermic reaction
(C) Endothermic reaction
(D) Oxidation reaction

Which of the following is a correct option ?

(a) (A) and (C)
(b) (C) and (D)
(c) (A), (C) and (D)
(d) (A) and (B)

3. What do you observe when you mix aqueous barium chloride solution with aqueous sodium sulphate solution in a test tube ?

(a) A pungent smelling gas is evolved.
(b) The colour of the solution turns blue black.
(c) A white ppt is formed immediately.
(d) No change in colour even after shaking the mixture well.

4. Which one of the following correctly represents sodium oxide ?

(a) $Na^{2+}\ 2\left[\begin{smallmatrix}\times\times\\ \times O \times\\ \times\times\end{smallmatrix}\right]^{2-}$
(b) $2Na^{2+}\ \left[\begin{smallmatrix}\times\times\\ \times O \times\\ \times\times\end{smallmatrix}\right]^{2-}$
(c) $2Na^{+}\ 2\left[\begin{smallmatrix}\times\times\\ \times O \times\\ \times\times\end{smallmatrix}\right]^{-}$
(d) $Na^{+}\ \left[\begin{smallmatrix}\times\times\\ \times O \times\\ \times\times\end{smallmatrix}\right]^{2-}$

5. Ethanol reacts with sodium and forms two products. These are :

(a) Sodium ethanoate and hydrogen
(b) Sodium ethanoate and oxygen
(c) Sodium ethoxide and hydrogen
(d) Sodium ethoxide and oxygen

6. Which of the following metals do not react with cold as well as hot water ?

(a) Na
(b) Ca
(c) Mg
(d) Fe

7. Choose the correct option for which properties of carbon is versatile element.
(i) Catenation
(ii) Tetra valency
(iii) Hydrogenation
(iv) Saponification
(a) only (i)
(b) both (i) and (ii)
(c) only (ii)
(d) None of these

8. Pulmonary artery develop from :
(a) Left Ventricle
(b) Right Ventricle
(c) Right Auricle
(d) Left Auricle

9. On plasmolysis a plant cell :
(a) Sweil up
(b) Burst
(c) Becomes flaccid
(d) Becomes turgid

10. Pepsin digests :
(a) Protein in stomach
(b) Carbohydrate in small intestine
(c) Fat in Ileum
(d) Protein in small intestine

11. At high altitude, the RBC in human blood will :
(a) increase in size
(b) decrease in size
(c) increase in numbers
(d) decrease in number

12. Lymph differs from blood in one of the following—
(a) No RBC and more WBC
(b) No WBC and more RBC
(c) Less RBC and more WBC
(d) More RBC and Less WBC

13. The component of blood responsible for transporting oxygen is :
(a) RBC
(b) WBC
(c) Platelets
(d) None of these

14. People on dialysis should not eat more _____ in their diet.
(a) Proteins
(b) Green and Leafy vegetables
(c) Carbohydrates
(d) Salts and fats

15. The hindrance presented by material of conductor to the smooth passing of electric current is known as :

(a) Resistance (b) Conductance

(c) Inductance (d) None of these

16. An object at a distance of 30 cm from a concave mirror gets its image at the same points. The focal length of the mirror is :

(a) –30 cm (b) 30 cm

(c) –15 cm (d) +15 cm

Q.17 to 20 consists of two statements Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below—

(a) Both (A) and (R) are true and (R) is the correct explanation of A.

(b) Both (A) and (R) are true and (R) is not the correct explanation of A.

(c) (A) is true but (R) is false.

(d) (A) is false but (R) is true.

17. **Assertion (A) :** When pH of rain water is more than 7 it is called Acid Rain.
Reason (R) : When electricity is passed through aqueous solutions of sodium chloride it decomposes from H_2 and Cl_2 gases.

18. **Assertion (A) :** In human if gene (B) is resoponsible for black eyes and Gene b is responsible for colour of brown eyes, then the colour of eyes of progeny having gene combination Bb, bb, BB will be black only.
Reason (R) : The black colour of eye is a dominant trait.

19. **Assertion (A) :** Each child has two versions of DNA both parental and maternal.
Reason (R) : Both father and mother contribute equal amounts of genetic material to their child.

20. **Assertion (A) :** Light does not travel in the same direction in all media.
Reason (R) : The speed of the light does not change as it enter from one transparent media to another.

SECTION-B

Explain the formation of $MgCl_2$ by electron transfer method. 2

With the help of suitable diagrams, explain how reproduction occurs in Hydra. 2

OR

What will happen when :

(a) A mature spirogyra filament attains considerable length ?

(b) Planaria gets cut into two pieces ?

3. An old man is advised by his doctor to take less sugar in his diet. Name the disease from which the man is suffering. Mention the hormone due to imbalance of which he is suffering from this disease. Which endocrine glands secrets this hormone ? Also mention the digestive enzyme secreted by this organ with one function of each. 2

24. How do Mendel's experiments show that traits may be dominant or recessive ? 2

25. List the properties of magnetic lines of force. (4 properties) ½×4=2

26. Draw all the possible isomers of pentane. 2

OR

Write the IUPAC name of the following compound—

(a) $CH_3CH_2COCH_3$ (b) CH_3CH_2COOH

SECTION-C

27. Discuss the method of Electrolytic Refinning of copper metal through a labelled figure. 3

28. A metal nitrate (A) on heating gives yellowish brown coloured metal oxide along with brown gas (B) and a colourless gas (C). Aqueous solution of (A) on reaction with potassium Iodide forms a yellow precipitate of compound (D). Identify A, B, C, D. Also Identify the types of both the reactions. 3

29. (a) The number of malaria patient increased tremendously when the large number of frogs were exported from the village. What would be the cause for it ? Explain with the help of food chain. 3

(b) Which of the following belongs to the first trophic level of food chain ? Why? Grass, Grasshopper, Plant, Rat, Tiger.

OR

How can we help in reducing the problem of waste disposal ? Suggest any three methods. 3

30. (a) What is meant by the power of accomodation of the eye ?

(b) Explain why the planets do not twinkle whereas stars does ?

31. (a) List the factors on which the resistance of a conductor in the shape of a wire depends. 3

(b) Why are metals good conductors of electricity whereas glass is a bad conductor of electricity ?

(c) Why are alloys commonly used in electric heating devices ?

OR

(a) A 6Ω resistance wire is doubled on itself. Calculate the new resistance of the wire.

(b) Three 2Ω resistors A, B and C are connected in such a way that the total resistance of the combination is 3Ω. Show the arrangement of the three resistors and justify your answer.

32. Draw ray diagram to represent the nature, position and size of the image formed by the convex lens for the object placed at : 3

(a) Infinity

(b) Between Focus and Optical Centre (O)

33. (a) What are genes ? Where are the genes located ? 3

(b) How do traits get expressed ?

SECTION-D

34. (a) A compound 'X' having a molecular formula C_2H_6O on treatment with concentrated sulphuric acid at 443 K gives compound 'Y'. 'X' also on reaction

with 'Z' having molecular formula $C_2H_4O_2$ gives a sweet smelling compound 'R'. Identify X, Y, Z and R. Also write the reaction involved in the process. 3

(b) Draw the electron dot structure of Butene. 1

(c) Define— ½+½=1

(i) Catenation (ii) Hydrogenation

OR

(a) Draw the structural formula of the following— ½×2=1

(i) Pentanal (ii) Propyne

(b) Explain the cleaning action of soap. 2

(c) Define— 1×2=2

(i) Saponification (ii) Substitution Reaction

35. (a) Name the human male reproductive organ that produces sperms an also secretes a hormone. Write the function of the secreted hormone. 5

(b) Name the part of the human female reproductive system where :

(i) Fertilization takes place

(ii) Implantation of the fertilised egg occurs

(c) Explain how the embryo gets nourishment inside the mother's body.

OR

Explain what happens when :

(a) Testosterone is released in males 1

(b) Pollen grains falls on the stigma of the flower. 1

(c) Egg fuses with sperm cell 1

(d) the egg is not fertilized 1

(e) buds are formed at the notches of Bryophyllum leaf. 1

36. Draw schematic diagram of a circuit containing of a battery of 3 cells of 2V each, a combination of three resistors of 10Ω, 20Ω and 30Ω connected in parallel, a

plug key and ammeter, all connected in series. Use this circuit to find the value of following—

(a) Current through each resistor

(b) Total current in the circuit

(c) Total effective resistance in the circuit.

OR

(i) Consider a conductor of resistance 'R', length '*l*', thickness 'd' and resistivity 'ρ'. Now this conductor is cut into four equal parts. What will be the new resistitivity of each of these parts ? Why ?

(ii) Find the resistance if all of these parts are connected in :

(a) Parallel (b) Series

(iii) Out of the combinations of resistors mentioned above in the previous part, for a given voltage which combination will consume more power and why ?

SECTION-E

37. Case Base Study Question—

The change in electric current through the circuit produces magnetic field around it. Magnetic field is a vector quantity which has both magnitude and direction. The magnetic field lines are produced directed from north and ends at South pole. These lines are closed curves from which strength of the magnetic field lines is determined. Where magnetic field is stronger lines are gowded and where every apart the strength of magnetic field is weak. So, we can say that as the current through the electrical circuit increases then the magnitude of magnetic field also increases. If a current carrying conductor is holded in right hand by curling figures around it. Then, the curled figures gives the direction of electric current and curled figures gives the direction of magnetic field.

As, the magnitude of magnetic field depends on the current through it. Also, if the

number of turns of insulated copper wire wound closely to form a cylindrical shape is called solenoid. Solenoid is used to produce magnetic field which can be used to magnetise the piece of magnetic material. And hence they are used in making electromagnet.

(a) What is the nature of magnetic field lines inside the solenoid ? 1

(b) Define solenoid. 1

(c) Draw the magnetic field lines through a current carrying solenoid. 2

OR

(c) Name the factors on which magnetic field depends and draw the magnetic field through the bar magnet.

38. The growing size the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organisms increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual acts for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population.

(a) Which contraceptive method changes the hormonal balance of the body ? 1

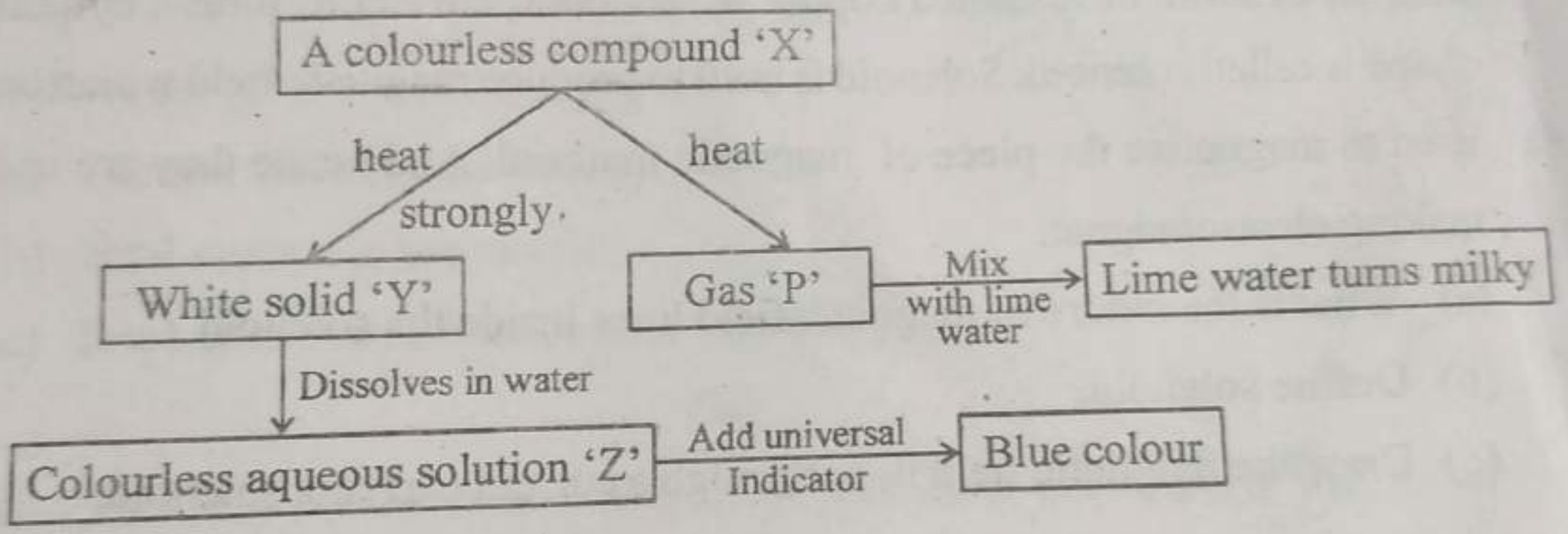
(b) What is the result of reckless female foeticide ? 1

(c) List two common signs of sexual maturation in boys and girls. 2

OR

Write two factors that determine the size of a population.

39. Lime is an alkaline substance. The figure shows some of the properties of a calcium compound 'X'. They are not chemical symbois of substances. Answer the questions that follow :



(a) Name an acid which can liberate 'P' from 'X'. 1

(b) Identify 'X' and 'Y'. 1

(c) Write chemical reaction from 'X' to 'Y' and identify 'P'. 2

OR

Identify 'Z' and write equation between 'Z' and 'P'.