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SET B



INDIAN SCHOOL MUSCAT
FIRST PRE-BOARD EXAMINATION
SCIENCE

CLASS: X

Sub. Code: 086

Time Allotted: 3 Hrs.

25.02.2021

Max. Marks: 80

General Instructions:

- (i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
- (ii) Section-A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
- (iii) Section-B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (iv) Section-C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (v) Section-D - question no. 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION – A

1. Name two metals which react with very dil. HNO_3 to evolve hydrogen gas? 1

OR

Why ionic compounds conduct electricity in molten state?
2. The electronic configuration of an element is 2,8,8,1. 1
State its group number and period number in the modern periodic table.
3. Which of the following pairs will give displacement reactions? 1
 - (a) FeSO_4 solution and Copper metal
 - (b) AgNO_3 solution and Copper metal
 - (c) CuSO_4 solution and Silver metal
 - (d) NaCl solution and Copper metal

4. The sky appears dark instead of blue to an astronaut. State its reason. 1
5. A concave mirror produced two times magnified real image of an object placed at 10cm in front of it. Where is the image located? 1
6. Both a spherical mirror and a thin spherical lens have a focal length of (-)10 cm. What type of mirror and lens are these? 1

OR

Name the type of mirror used in the following situations

- (a) Head lights of a car
- (b) Side rear view mirror of a vehicle

7. What is the basic cause of induced emf? 1
8. Why don't two magnetic field lines intersect each other? 1
9. How can three resistors of resistances 3 ohm, 3 ohm and 6 ohm be connected to give a total resistance of 5 ohm 1

OR

Why are the coils of electric toasters and electric irons made of an alloy rather than a pure metal?

10. **Cite an example for A) SINGLE CIRCULATION B) DOUBLE CIRCULATION in animals**

11. How the energy released during cellular respiration is utilized? 1

OR

Name the enzymes present in the pancreatic juice

12. Earthen plates are preferred than plastic plates now a days, why? 1

OR

The maximum number of trophic levels in a food chain will not exceed more than four or five. Justify this statement

13. What is the difference between the lymph and the blood plasma? 1

For question numbers 14, 15 and 16, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

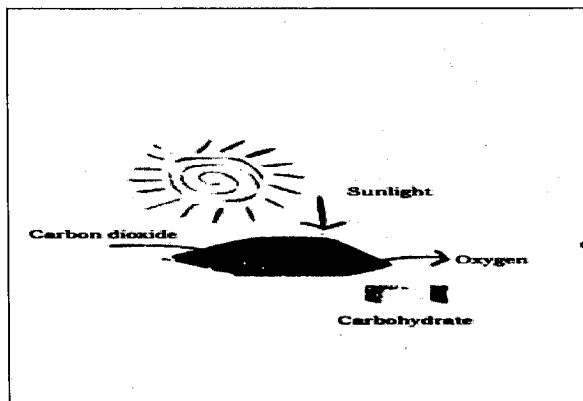
- a) Both A and R are true, and R is correct explanation of the assertion.
- b) Both A and R are true, but R is not the correct explanation of the assertion.
- c) A is true, but R is false.
- d) A is false, but R is true.

14. Assertion: Photosynthesis is considered as an endothermic reaction. 1
Reason: Energy gets released in the process of photosynthesis.
15. Assertion: The length and complexity of food chains vary greatly. 1
Reason: The energy decreases from one trophic level to another trophic level.

16. Assertion : In Mendel's experiment, the tallness(gene denoted by letter 'T') which appeared in the F1 generation is considered to be the dominant trait and the shortness(gene denoted by letter 't') is considered to be the recessive trait 1
Reason: A single copy of "T" is enough to make the plant tall, while both copies have to be "t" for the plant to be short.

Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Read the paragraph, observe the diagram and answer the questions given below. Each question carries 1 mark. 1x4



The process by which an organism takes food and utilizes it, is called nutrition. The mode of nutrition in which an organism prepares its own food is called autotrophic nutrition. Autotrophic nutrition is fulfilled by the process, by which autotrophs intake CO_2 and H_2O , and convert these into carbohydrates in the presence of chlorophyll and sunlight. Water comes to the leaf from the soil, through the xylem tissue in roots and stems. Carbon dioxide comes in the leaves through stomata. Stomatal pores are seen in the lower side of the leaf surface. Stomatal pores are surrounded by guard cells, which controls the opening and closing of the stomata.

i) The standard equation representing the process of autotrophic nutrition.

- (a) $6 \text{ glucose} + 12 \text{ oxygen} \longrightarrow 6 \text{ carbohydrate} + 6 \text{ carbon di oxide}$
 (b) $6 \text{ carbon di oxide} + 12 \text{ water} \longrightarrow \text{glucose} + 6 \text{ oxygen} + 6 \text{ water}$
 (c) $12 \text{ carbon di oxide} + 6 \text{ water} \longrightarrow \text{glucose} + 2 \text{ oxygen}$
 (d) $6 \text{ oxygen} + 6 \text{ water} \longrightarrow 6 \text{ glucose} + 6 \text{ water}.$

ii) The production of food in autotrophs will take place only in presence of sunlight. Which cells in leaf can absorb this light energy

- (a) Epidermal cells
 (b) Xylem tracheid
 (c) Guard cells
 (d) All the above

iii) Which among the following organisms exhibit saprophytic mode of nutrition

- (a) Amar-bell

- (b) Leeches
- (c) Mushroom
- (c) Autotrophic bacteria

- iv) The opening and closing of the stomatal pore is regulated by
- (a) Entry and exit of water inside and from the guard cells
 - (b) Diffusion of water from epidermal cells to palisade cells
 - (c) The pressure exerted by the xylem cells
 - (d) Translocation of food from one phloem cell to the other.

- v) In parasitic mode of nutrition
- (a) Food is taken inside the body and digested
 - (b) Break-down the food outside the body and then absorb it
 - (c) Take in the food material through the body surface and digested inside
 - (d) Derive the nutrition without killing the host

18. Organic compounds are made up of carbon, oxygen, hydrogen, and few other elements. However, 1x4
the number of organic compounds is far bigger than inorganic compounds that do not form bonds. The distinct nature of carbon atom and its capacity to form bonds with other atoms leads to such huge number of organic compounds. The versatile nature of carbon can be best understood with its features such as, tetravalency and catenation. In this section let us learn more about versatility of carbon. Homologous series is a series of compounds with similar chemical properties and some functional group differing from the successive member by CH_2 . Carbon chains of varying length have been observed in organic compounds having the same general formula. Such organic compounds that vary from one another by a repeating unit and have the same general formula form a series of compounds.

- i) C_3H_8 belongs to the homologous series of
- (a) Alkynes
 - (b) Alkenes
 - (c) Alkanes
 - (d) Cyclo alkanes
- ii) Why does carbon form compounds mainly by covalent bonding?
- (a) There are four electrons in the outermost shell of carbon.
 - (b) It requires large amount of energy to form C^{4+} cation.
 - (c) It shares its valence electrons to complete its octet.
 - (d) All the above.
- iii) Which of the following belongs to homologous series of alkynes?
- C_6H_6 , C_2H_6 , C_2H_4 , C_3H_4 .
- (a) C_6H_6
 - (b) C_2H_4
 - (c) C_2H_6
 - (d) C_3H_4

iv) A hydrocarbon has four carbon atoms. Give its molecular formula if it is an alkene.

- (a) C_4H_{10}
- (b) C_4H_8
- (c) C_4H_6
- (d) C_4H_4

v) The first member of the alkyne homologous series is

- (a) propyne
- (b) ethyne
- (c) methane
- (d) ethene

19. Four friends went to a picnic. The weather was pleasant. They played various games and then had snacks. Suddenly, Shyam, one of them, noticed seven colours in the sky. He asked others, WOW, what a rainbow! Then Ram, one of them, asked him What is rainbow? He then explained to all about its formation. After that everyone in the group thanked him for the knowledge, he had given to them. 1x4

(i) White light is made up of

- (a) Seven colours
- (b) six colours
- (c) all colours
- (d) no colour

(ii) Which device can be used to obtain band of colours from white light?

- (a) Prism
- (b) rectangular glass slab
- (c) lenses
- (d) prism and lenses

(iii) If Shyam was facing the rainbow, then where was the sun?

- (a) In front of him
- (b) behind of him
- (c) left side of him
- (d) right side of him

(iv) Splitting of white light into seven colours on passing through a glass prism is called-----

- (a) reflection
- (b) refraction
- (c) scattering
- (d) dispersion

(v) Which of the colours of visible light has minimum frequency

- (a) Violet
- (b) red
- (c) yellow
- (d) Green

20. Rahul once went to a construction site along with his father. There he saw large cranes lifting heavy iron loads. After sometimes, he noticed that all the cranes were lifting a bunch of iron rods and unloading it to other places. He was surprised and then enquired the crane operator about it. The crane operator then explained the use of electricity in lifting the load. A permanent magnet is one that retains its magnetic properties for a long period of time. Examples are iron, nickel, cobalt and some rare earth alloys etc. Temporary magnets are those that simply act like permanent magnets when they are within a strong magnetic field. Electromagnet works on the principle of magnetic effect of electric current. It is formed when a strong magnetic field is produced inside a solenoid to magnetise a piece of magnetic material like soft iron. An electromagnet acquires the magnetic properties only when an electric current is passed through the solenoid. Once the current is switched off, it almost loses its magnetic properties. 1x4

(i) According to you, which effect of electricity in lifting the load?

- (a) Magnetic effect of electric current
- (b) electromagnetic induction
- (c) heating effect
- (d) chemical effect

(ii) Indicate which of the following material does not retain magnetism permanently.

- (a) soft iron
- (b) stainless steel
- (c) alnico
- (d) none of the above

(iii) The factors on which one magnetic field strength produced by the crane depends are

- (a) Magnitude of current
- (b) Number of turns
- (c) Nature of core material
- (d) All of the above

(iv) A soft iron bar is introduced inside a current –carrying solenoid. The magnetic field inside the solenoid

- (a) will become zero
- (b) will decrease
- (c) will increase
- (d) will remain unaffected

(v) Magnetic lines of force inside current carrying solenoid are

- (a) Perpendicular to axis.
- (b) Along the axis and are parallel to each other.
- (c) parallel inside the solenoid and circular at the ends.
- (d) circular.

SECTION - B

21. Write two difference between aerobic and anaerobic respiration with respect to energy production and end products. 2

OR

Capillaries are one cell thick blood vessels. Justify this statement.

22. Mention any two physical changes that happen during inhaling of air during breathing. 2
23. Asmath has been collecting silver coins and copper coins, one day she observed a black coating on silver coins and a green coating on copper coins, which chemical phenomena is responsible for these coatings? Write the chemical name of black and green coatings. 2

OR

Name the gas evolved and write the chemical equation when sodium hydrogen carbonate is made to react with dil. HCl.

How to test the above gas?

24. Show the electron transfer in the formation of MgO and K₂O from its elements. 2
25. Draw a ray diagram to show formation of image of a distant object by a concave lens. Mention the nature of image formed. 2
26. State Ohm's law. Write the necessary conditions for its validity 2

SECTION - C

27. When a pea plant with round seeds crossed with another pea plant with wrinkled seeds, the first generation (F₁) shows all round seed plants. Write the expected progenies in the second generation when the F₁ is selfed. What is the phenotypic and genotypic ratio of the F₂? (Denote the character round with R and wrinkled with r) 3

OR

What leads to variation in a specific population of organisms? Do all these variants have equal chances of survival? Explain.

28. The increase or decrease in the number of a particular organism in a food chain will affect the balance of the food chain thereby the balance of the ecosystem. Justify this statement with an example. 3
29. Name the functional unit of kidney. What are the substances that are selectively reabsorbed from the initial filtrate? (Any three). How can we control the urge to urinate? 3
30. The atomic number of an element X is 20. 3
- (i) Determine the position of element in the periodic table.
- (ii) Write the formula of compound formed when X reacts with another element Y of atomic number 8.
- (iii) What is the nature of the above compound formed? Justify your answer.

31. Samples of four metals A, B, C and D were taken and added to the following solutions one by one. The result obtained has been tabulated as follows. 3

| Metal | FeSO ₄ | CuSO ₄ | ZnSO ₄ | AgNO ₃ |
|-------|-------------------|-------------------|-------------------|-------------------|
| A | No reaction | Displacement | | |
| B | Displacement | | No reaction | |
| C | No reaction | No reaction | No reaction | Displacement |
| D | No reaction | No reaction | No reaction | No reaction |

Use the above table to answer the following questions about metals A, B, C and D

- Which is the most reactive metal?
- What would you observe if B is added to a solution of CuSO₄?
- Arrange the metals A, B, C and D in the order of decreasing reactivity?

32. What is meant by isomers? 3

Draw the structure and write the names of two isomers of butane(C₄H₁₀)

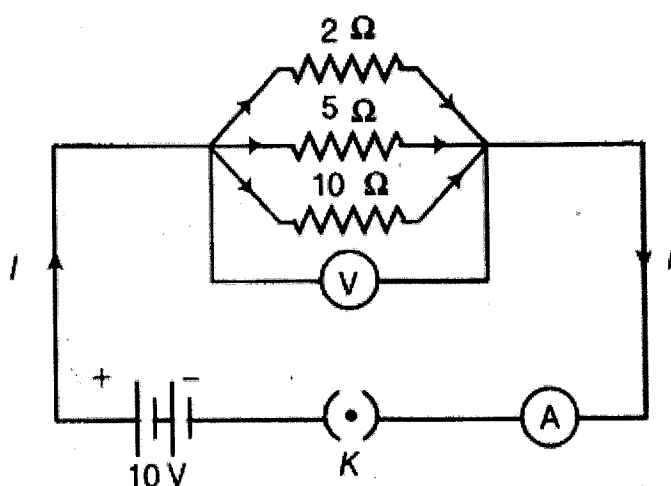
33. What is understood by lateral displacement of light? Illustrate it with the help of a diagram. List any two factors on which the lateral displacement of a particular substance depends. 3

SECTION - D

34. (a) Circuit diagram is given below from that 5

Calculate,

- The current through each resistor
- The total current in the circuit
- The total effective resistance of the circuit



- (b) Two wires A and B are of equal length, different cross sectional areas and made of same metal.

- (i) Name the property which is same for both the wires,
- (ii) Name the property which is different for both the wires

OR

- (a) Define electrical current with S.I. unit?
- (b) A house hold uses the following electric appliance;
 - (i) Refrigerator of rating 400w for ten hour each day.
 - (ii) Two electric fans of rating 80w each for twelve hours each day.
 - (iii) Six electric tubes of rating 18w each for 6 hours each day.

Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is Rs. 3.00.

35. (a) When electricity is passed through a common salt solution, sodium hydroxide is produced along with the liberation two gases 'X' and 'Y'. The gas 'X' burns with a pop sound whereas 'Y' is used for disinfecting drinking water. 5
- (i) Identify X and Y.
 - (ii) Give the chemical equation for the reaction stated above.
 - (iii) State the reaction of Y with dry slaked lime.
- (b) How is sodium hydrogen carbonate formed during Solvay process separated from a mixture of NH_4Cl and NaHCO_3 ?
- (c) With the help of a chemical equation to represent how sodium carbonate is obtained from sodium hydrogen carbonate?

OR

- (a) What is meant by water of crystallization?
 - (b) How many molecules of water are present in hydrated ferrous sulphate? Write its formula.
 - (c) What colour change do you observe when it is heated?
 - (d) What is chlor- alkali process? Name the two gases evolved at anode and cathode by this process.
36. (a) Draw a neat diagram of female reproductive system. label the following parts 5
- (i) Site of fertilization
 - (ii) Site of implantation of the embryo
 - (iii) Opening of uterus
 - (iv) Production of eggs
- (b) Name the type of reproduction in the following organisms
- (i) Spirogyra
 - (ii) Bryophyllum
 - (iii) Plasmodium
 - (iv) Hydra

End of the Question Paper