Pre Board Exam, 2019-20
Science (086)
Class – X

Time: 3hr **M.M: 80**

General Instructions:

1. The question paper comprises three sections – A, B and C. Attempt all the sections.
2. All questions are compulsory.
3. Internal choice is given in each section.
4. All questions in Section A are one-mark questions comprising MCQ, VSA type and Assertion-reason type questions. They are to be answered in one word or in one sentence.
5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.
6. All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.
7. This question paper consists of a total of 31 questions.

SECTION A

1. What is the minimum wind velocity required for obtaining useful energy with a windmill? [1]

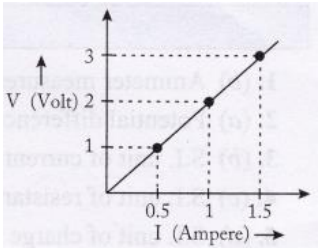
   a. 1km/h

   b. 5km/h

   c. 15km/h

   d. 115km/h

2. The given graph, is plotted for V-I to verify Ohm's law. [1]



The resistance of the conductor used in the experiment is:

   a. 1 Ω

   b. 1.5 Ω

   c. 3 Ω

   d. 2 Ω

3. In refraction of light, the angle of incidence and angle of refraction is same when: [1]

   a. $\angle i = 90°$
   b. $\angle i = 180°$
   c. $\angle i = 0°$
   d. None of these

4. Oils on treating with hydrogen in presence of platinum catalyst form fats. This is an example of: [1]
   a. Substitution reaction
   b. Addition reaction
   c. Elimination reaction
   d. Oxidation.
5. Which of the following can be used as an acid-base indicator by a visually impaired student? [1]
   a. Turmeric
   b. Phenolphthalein
   c. Vanilla essence
   d. Petunia leaves
6. Which among the following alloys contain zinc as one of its constituents? [1]

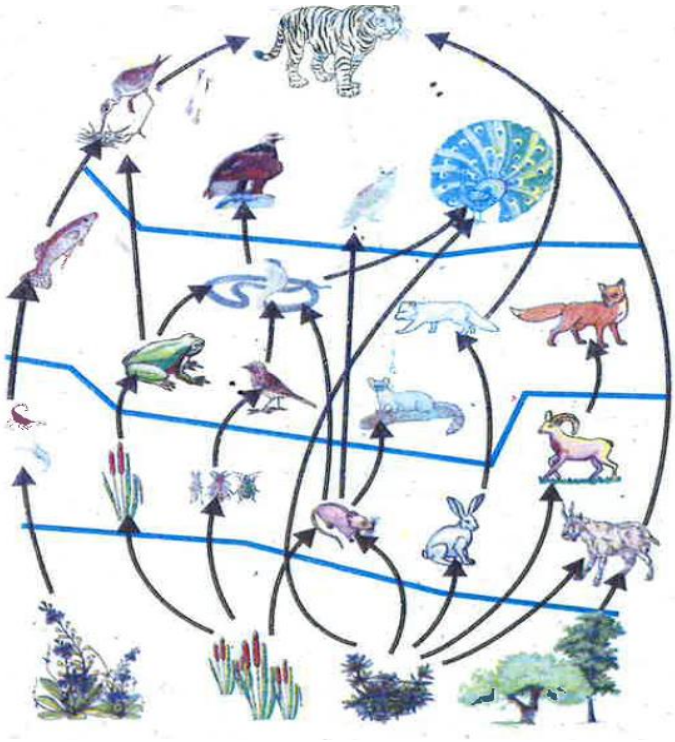
   a. Stainless steel
   b. Brass
   c. Bronze
   d. Solder

   OR

   Although metals form basic oxides, which of the following metals form an amphoteric oxide?

   a. Al
   b. Na
   c. Ca
   d. Cu

7. In a flower, the parts that produce male and female gametes (germ cells) are: [1]
   (a) stamen and anther
   (b) filament and stigma
   (c) anther and ovary
   (d) stamen and style

8. 

(i) From the above picture, name an omnivore and a tertiary consumer. [1]

(ii) Differentiate between the above picture and a food chain. [1]

(iii) 'Food chains generally consist of three or four steps'. Give a reason. [1]

(iii) Draw a labelled food chain from the above picture that consists of five trophic levels. [1]

9. Select the set of homologous organs from the following: [1]

(a) Wings of pigeon and butterfly
(b) Forelimbs of cow, duck and a lizard
(c) Wings of bat and pigeon
(d) Wings of butterfly and bat

10. **In the following questions, the Assertions (A) and Reason (R) have been put forward. Read both the statements carefully and choose the correct alternative from the given codes as a), b), c), d) and e):**

a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) The assertion and reason both are false.
e) Assertion is false but reason is true.

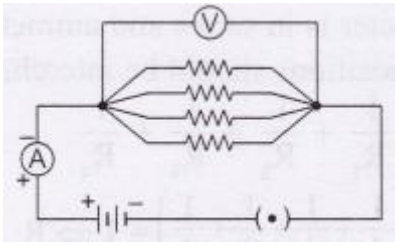
i. **Assertion (A):** In Fleming's Left Hand Rule, the direction of magnetic field, force and current are mutually perpendicular to each other. [1]
Reason (R): Fleming's Left Hand Rule is applied to measure the induced current.

ii. **Assertion (A):** Group 2 elements are called alkaline earth metals. [1]
Reason (R): Group 2 elements can lose electrons to from divalent cations.

11. A student holding a mirror in his hand directed the reflecting surface of the mirror towards the Sun. He then directed the reflected light on to a sheet of paper held close to the mirror.

    a. What should he do to burn the paper? [1]
    b. Which type of mirror does he have? [1]

12. Four resistors, each of resistance 2 Ω, are connected in parallel. What is the effective resistance? [1]



13. How is wood converted into charcoal? Why Charcoal is preferred over wood? [1]

14. 3g of ferrous sulphate is heated in a boiling test tube. Give the balanced chemical equation that represents the chemical change. [1]

15. Why are properties of elements belonging to the same period different? [1]

SECTION B

16. i. Alloys are used in electrical heating devices rather than pure metals. Give reason. [3]
    ii. Resistance of a metal wire of length 1 m is 26 Ω at 20°C. If the diameter of the wire is 0.3 mm, what will be the resistivity of the metal wire at that temperature?

17. An object 5 cm high is held 25 cm away from a converging lens of focal length 10 cm. Find the position, size and nature of the image formed. Also, draw the ray diagram. [3]

18. What is atmospheric refraction? Explain with the help of a labelled diagram that the position of a star as seen by us is not its true position. [3]

OR

When do we consider a student sitting in the class to be myopic? List two causes of this defect. Explain using a ray diagram how this defect of the eye can be corrected.

19. 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 and D. Give the chemical equation which represent the reaction between the aqueous solution of A and potassium iodide. [3]

20. Give reasons: [3]
    i. Tap water conducts electricity whereas distilled water does not.
    ii. Plaster of Paris should be stored in moisture proof containers.
    iii. During summer season milkman usually adds a very small amount of baking soda to fresh milk.

21. The atomic number of an element ‘P’ is 19. Write [3]

i. Its electronic configuration.
ii. Identify the period and group of which ‘P’ belong?
iii. Give the formula of the compound formed when the element ‘P’ reacts with an element ‘Q’ of atomic number 8.

OR

An element ‘X’ belongs to 2nd period and group 15 of the modern periodic table.

i. Determine the number of valence electrons and valency of ‘X’.
ii. Give the molecular formula of the compound formed when ‘X’ reacts with hydrogen and write the electron dot structure of the compound formed.

22. How do Mendel’s experiments show that the gene may be dominant or recessive? [3]

23. (i) Name the tissue, which transports soluble products of photosynthesis in plants. [3]
(ii) Which organ secretes a hormone when the blood sugar level rises? Name a digestive enzyme and hormone released by this organ.

24. Differentiate between asexual reproduction and vegetative propagation. Give any two advantages of vegetative propagation. [3]

OR

(i) Write a note on saprophytic nutrition.
(ii) Draw a labelled diagram of human excretory system and label its parts.

25. What is the importance of DNA copying in reproduction? [3]

SECTION C

26. i. List in tabular form two major differences between electric motor and electric generator. [5]
ii. Draw the labelled schematic diagrams of a motor and a generator

OR

i. Name the three types of wires used in household circuits. Out of these three, which wire is used as a safety measure especially for those appliances that have metallic body? State the colour of insulation used for this wire. How it ensures the safety of the user?
ii. An electric fuse of rating 3 A is connected in a circuit in which an electric iron of power 1.5 kilo watt is connected which operates at 220 V. What would happen? Explain.

27. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm. [5]

i. What should be the range of distance of an object placed in front of the mirror?
ii. Will the image be smaller or larger than the object? Draw ray diagram to show the formation of image in this case,.
iii. Where will the image of this object be, if it is placed 6 cm in front of the mirror? Draw ray diagram for this situation to justify your answer.
Show the position of pole, principal focus and the centre of curvature in the ray diagram.

28. An organic compound A ($C_2H_4O_2$) when treated with another compound B (C_2H_6O) forms a pleasant smelling substance C. When B on treating with alkaline $KMnO_4$ gives the same compound A. Identify the structure of A, B and C. Give the chemical equations for the reactions involved. Also give the IUPAC name and one of the use of compound C. Compound A is used as a food preservative. [5]

OR

i. Give the structure of first two members of the homologous series containing –OH as functional group.
ii. Draw the structure of Benzene.
iii. What are micelles? Explain why soap fails in hard water?

29. i. What is Cinnabar? Explain with the help of chemical equations the extraction of metal from Cinnabar via. reduction. [5]
ii. What are alloys? How alloys are prepared?

30. List the major endocrine glands and state their position in the human body. Name the hormones released by these and write functions of any two of these hormones. [5]

OR

Discuss the breakdown of glucose by the various pathways?

31. What is a dam? Why do we seek to build large dams? While building large dams, which three main problems should particularly be addressed to maintain peace among local people? Mention them. [5]

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