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SAMPLE TEST PAPER 03 FOR CLASS X BOARD EXAM 2021

SUBJECT: SCIENCE

MAX. MARKS : 80

CLASS : X

DURATION : 3 HRS

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 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 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 the agents which bring about cross pollination.
2. Why is lake considered to be a natural ecosystem?
3. What is transpiration?

OR

List two functions of transpiration.

4. Name two enzymes that convert sugarcane juice into glucose and fructose.

OR

Which enzyme is responsible for conversion of glucose and fructose into ethanol and carbon dioxide?

5. Why the chemical equation should be balanced?

OR

What are reactants and products?

6. Define electropositivity.

7. What are the sex chromosomes in the males and females?

OR

Is the father responsible for the sex of the child?

8. What are the functions of lymph in the body?

9. What are the end products of aerobic respiration?

10. Why is variation important for a species?

OR

What is DNA copying? State its importance.

11. What are the factors on which the resistance of a conductor depends?

12. What are the functions of Ovary?

13. What is ozone? Name the chemicals that damage the ozone layer.

Directions for question numbers 14 to 16: Two statements are given, one labelled Assertion (A) and the other labelled 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 (A):** Plastics are non- biodegradable.

Reason (R): Enzymes cannot degrade plastics.

15. **Assertion (A):** High chances of fertilisation is during the mid of the menstrual cycle.

Reason (R): Sperms are very active during that time.

OR

Assertion (A): Placenta is connected to the embryo through an umbilical cord which helps in the transport of substances to and from the embryo.

Reason (R): Placenta acts as an endocrine tissue.

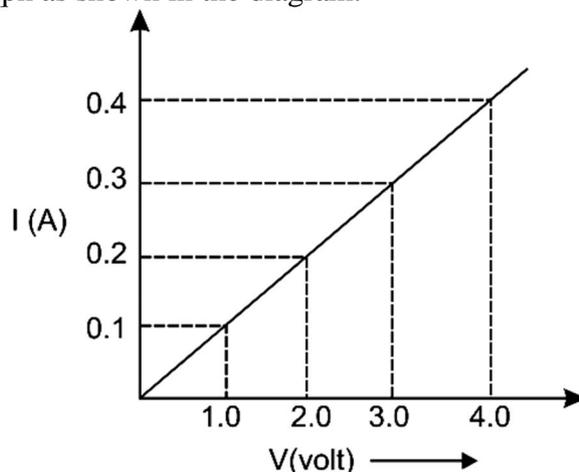
16. **Assertion (A):** Across a period atomic radius decreases.

Reason (R): It is because electron is added to the same shell.

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

17. **Read the following passage and answer the questions 17 (i) to 17 (iv):**

In an experiment to study the dependence of current on potential difference across a resistor, a student obtained the graph as shown in the diagram.



(i) What does the slope of the curve indicate?

- (a) Potential difference
- (b) Resistance of the resistor
- (c) Energy consumed by resistor
- (d) Charge flowing through conductor

(ii) A variable resistance is:

- (a) resistor
- (b) rheostat
- (c) galvanometer
- (d) electric cell

(iii) The value of resistance of the resistor is:
(a) 0.1 ohm (b) 1.0 ohm (c) 10 ohm (d) 100 ohm

(iv) Name the physical quantity expressed as the product of potential difference and electric current.

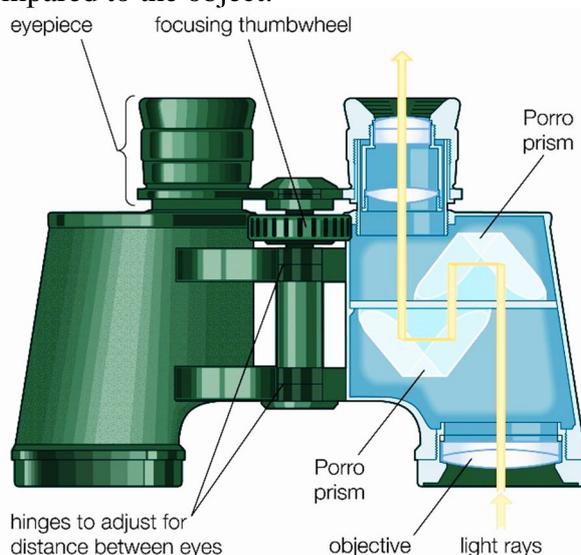
(a) Electric power (b) Resistivity (c) Electrical potential (d) Heat

(v) Which of the following is correct Ohm's law formula given?

(a) $V = I/R$ (b) $V = IR$ (c) $I = V/R$ (d) None of these

18. Read the following and answer any four questions from 18 (i) to 18 (v):

Binoculars, like telescopes, produce, magnified images of faraway objects. Figure shows a typical binocular design. Each side of the binoculars is like a small telescope: light enters a convex objective lens, which inverts the image. The light then travels through two prisms that which is used to completely reflect the incoming ray to invert the image again, so that the viewer sees an image that is upright compared to the object.



(i) Binocular is basically a:

(a) microscope (b) telescope (c) dispersion device (d) magnifying glass

(ii) Prisms are used in binoculars:

(a) for reflection (b) for refraction (c) for dispersion (d) for total internal reflection

(iii) Binoculars are used to see:

(a) near objects (b) far objects (c) both near and far objects (d) none of these

(iv) Refractive index of air is:

(a) 1.00 (b) 0.5 (c) 1.5 (d) 2.0

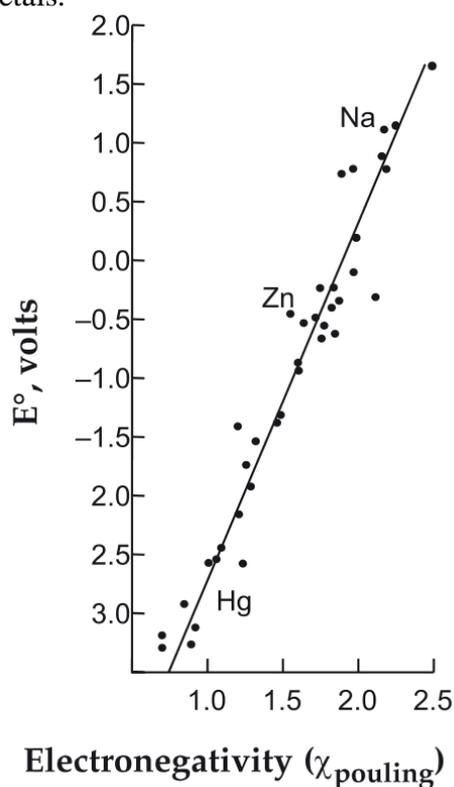
(v) The lens facing object in binocular is called:

(a) object lens (b) objective lens (c) intermediate lens (d) eye lens

19. Read the following and answer any four questions from 20(i) to 20(v).

The reactivity series of metals, also known as the activity series, refers to the arrangement of metals in the descending order of their reactivities. Metals tend to readily lose electrons and form cations. Most of them react with atmospheric oxygen to form metal oxides. However, different metals have different reactivities towards oxygen (unreactive metals such as gold and platinum do not readily form oxides when exposed to air). Apart from providing insight into the properties and reactivities

of the metals, the reactivity series has several other important applications. The following graph shows the activity series of metals.



(i) Which of the following is the correct arrangement of the given metals in ascending order of their reactivity? Zinc, mercury, aluminium, Sodium

- (a) Zinc > mercury > aluminium > Sodium
- (b) Sodium > aluminium > mercury > Zinc
- (c) Sodium > Zinc > aluminium > mercury
- (d) Sodium > aluminium > Zinc > mercury

(ii) Oxides of moderately reactive metals like Zinc, Iron, Nickel, Tin, Copper etc. are reduced by using:

- (a) hydrogen as reducing agent
- (b) Carbon as reducing agent
- (c) Sodium as reducing agent
- (d) magnesium as reducing agent

(iii) In the given reaction,



What is element X?

- (a) NaAlO_2 (b) Na_3Al (c) Na_2O_3 (d) NaAl_2O_3

(iv) Generally, metals react with acids to give salt and hydrogen gas. Which of the following acids do not give hydrogen gas on reacting with metals (except Mn and Mg)?

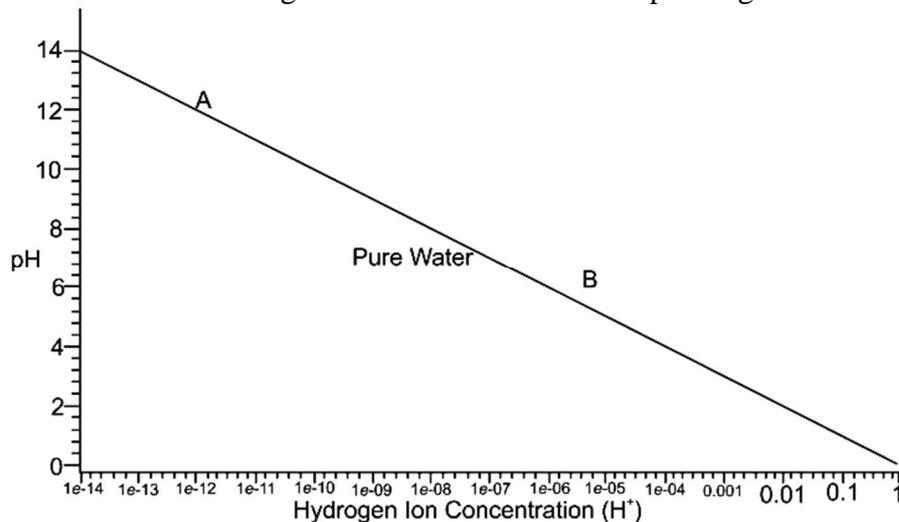
- (a) H_2SO_4 (b) HCl (c) HNO_3 (d) All of these

(v) An aluminium strip is kept immersed in freshly prepared ferrous sulphate solution taken in a test tube, the change observed is that

- (a) Green solution slowly turns brown
- (b) Lower end of test tube become slightly warm
- (c) A colourless gas with the smell of burning sulphur is observed
- (d) Light green solution changes to blue.

20. Read the following and answer any four questions from 19 (i) to 19 (v):

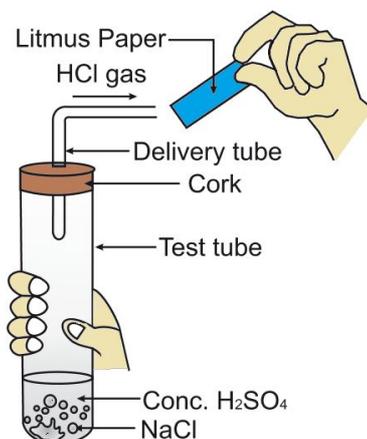
Add - Base indicators (also known as pH indicators) are substances which change colour with pH. They are usually weak acids or bases, which when dissolved in water dissociate slightly and form ions. At a low pH, a weak add indicator is almost entirely in the H^+ Ion form, the colour of which predominates. As the pH increases - the intensity of the colour of H^+ Ion decreases. An indicator is most effective if the colour change is distinct and over a low pH range.



(i) Litmus solution is a purple dye, which is extracted from:

- (a) Lichen, an algae
- (b) Petunia, an algae
- (c) Lichen, a fungus
- (d) Petunia, a fungus

(ii) The figure given below represents the experiment carried out between conc. sulphuric acid and sodium chloride, which react with each other to form HCl gas.



Blue litmus paper is brought near the mouth of the delivery tube to check the presence of HCl acid but no change is observed in the colour of litmus paper because:

- (a) The litmus paper used is dry
- (b) The litmus paper used is moist
- (c) Blue litmus paper does not change its colour with an acid
- (d) The litmus paper is kept very close to the mouth of the delivery tube

(iii) The sample of soil from a particular place was tested for its pH value. It came out to be 5. Which one of the following should be added to the soil to make it suitable for the plant growth?

- (A) Calcium chloride (B) Calcium Hydroxide (C) Calcium oxide
- Choose the correct option:
(a) Both (A) and (B)

- (b) Both (B) and (C)
- (c) Only (A)
- (d) Only (C)

(iv) In terms of acidic strength, which one of the following is in the correct increasing order?

- (a) Water < Hydrochloric acid < Acetic acid
- (b) Acetic acid < Water < Hydrochloric acid
- (c) Hydrochloric acid < Water < Acetic acid
- (d) Water < Acetic acid < Hydrochloric acid

(v) A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

- (a) Lemon juice
- (b) Vinegar
- (c) Common salt
- (d) An antacid

SECTION – B

21. A reddish brown coloured metal used in electrical wires when powdered and heated strongly in an open china dish its colour turns black. When hydrogen gas is passed over this black substance it regains its original colour.

Based on above information answer the following questions:

- (i) Name the metal and black coloured substance formed.
- (ii) Write balanced chemical equations for both the reactions.

OR

Write the balanced equations for the following and mention the type of the reaction involved:

- (i) Aluminium + Hydrogen bromide → Aluminium bromide + Hydrogen gas
- (ii) Calcium carbonate → Calcium oxide + Carbon dioxide

22. Give two points of differences between food chain and food web.

23. Write the function of the following with respect to the point given below:

- (i) Inner lining of uterus is richly supplied with blood.
- (ii) Pollen tube develops from pollen grains when pollen grains land on stigma.

24. Write the molecular formula of ethene and draw its electron dot structure.

OR

Write the molecular formula of the 2nd and 3rd member of the homologous series where the first member is Ethyne.

25. What were the different characters that Mendel took to perform his experiments on heredity?

26. What is ATP and how is it used by the body?

OR

What are the components of xylem and how does it help in transporting water and minerals in the body?

SECTION – C

27. What happens to the value of current when a number of resistors are connected in series in a circuit? What would be their equivalent resistance?

28. Explain the periodicity of following properties of elements: (i) Atomic radius (ii) Ionisation enthalpy (iii) Electro negativity
29. (i) State five differences between an electromagnet and a permanent magnet.
(ii) Explain the principle, construction and working of an electric motor with a help of labelled diagram?
30. (i) With the help of a diagram show asexual reproduction in Rhizopus. How is this method advantageous to Rhizopus?
(ii) Write the full form of DNA? Name the part of the cell where it is located. Explain its role in the process of reproduction of cell.
31. (i) (a) Define indicator. Name two indicators obtained from plants.
(b) Write balanced chemical equation for the reaction that takes place when sodium oxide reacts with water. How will this solution behave towards phenolphthalein and red litmus paper?
(c) State what happens when sodium hydroxide solution reacts with dilute hydrochloric acid. What is this reaction called?
(ii) (a) What are organic acids and mineral acids?
(b) Give two examples each of organic acids and mineral acids.
(c) State some of the uses of mineral acids in industry.
32. (i) (a) On which surface of prism there is both the dispersion and deviation of light, and on which surface of prism, there is only the deviation of light?
(b) Name the subjective property of light related to its wavelength.
(c) How does the speed of light in glass changes on increasing the wavelength of light?
(ii) Which colours of light bends the least and the most while passing through the prism. Give reason.
(iii) Suppose a monochromatic ray of light passes through a glass prism. Mark the angle of incidence, angle of emergence and angle of deviation.

OR

Refractive index of water with respect to air is 1.33 and that of diamond is 2.42.

- (i) In which medium does the light move faster, water or diamond?
(ii) What is the refractive index of diamond with respect to water?

33. (i) Explain with the help of the pattern of magnetic field lines the distribution of magnetic field due to a current carrying a circular loop.
(ii) Why is it that the magnetic field of a current carrying coil having n turns, is 'n' times as large as that produced by a single turn (loop)?

SECTION – D

34. (i) In one of his experiments with pea plant Mendel observed that when a pure tall pea plant is crossed with a pure dwarf pea plant in F₁ generation only tall plants appear.
(a) What happens to the trait of dwarfness in this case?
(b) When plants of F₁ generation were crossed he observed that in F₂ generation both tall and dwarf plants were present. Why did it happen?
(ii) A pea plant with blue colour (BB) is crossed with a pea plant with white flower (ww).
(a) What is the expected colour of flowers in F₁ generation?
(b) What will be the % of plants bearing white flowers in F₂ generation if flowers of F₁ progeny were selfed?
(c) State the expected ratio of the genotype BB and Bw in F₂ progeny.

35. Write uses of: (i) Acids (ii) Bases (iii) Salts

OR

For making cake, baking powder is taken. If at home your mother uses baking soda instead of baking powder in cake.

- (i) How will it affect the taste of the cake and why?
- (ii) How can baking soda be converted into baking powder?
- (iii) What is the role of tartaric acid added to baking soda?

36. (i) Write down the lens formula. What is the magnification produced by a lens?

- (ii) A 2 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image. What is its magnification?

