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SAMPLE TEST PAPER 01 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. What would you observe when you put some aluminium pieces in copper sulphate solution?

2. When the lightning strikes, 100 C of charge flow in 0.02 s. What is the current?

3. Filament type electric bulbs are not power efficient. Explain.

4. Name any two biodegradable pollutants.

OR

List four common solid waste disposal methods.

5. Write any two characteristics of food web.

6. Out of the three elements P, Q and R having atomic numbers 11, 17 and 19 respectively, which two elements will show similar properties and why?

OR

List any two properties of the elements belonging to the first group of the Modern Periodic Table.

7. A current carrying conductor is placed in a magnetic field. List the factors on which the magnitude of force experienced by conductor depends.

8. A wire having a resistance of 10 W is bent to form a circle. What is the effective resistance between the two points along any diameter of the circle?

OR

Write the relation between resistance (R) of filament of a bulb, its power (P) and a constant voltage V applied across it.

9. State the effect of magnetic field on the path of a charged particle moving in it.

10. Draw ray diagrams to show the principal focus of a concave mirror.

OR

Explain why a ray of light passing through the centre of curvature of a concave mirror gets reflected along the same path.

11. Why plastic bags and containers should not be disposed off by burning? Give reason.

12. Name the cartilaginous flap which doses the glottis to check the entry of food into it during swallowing.

OR

Define variations.

13. Define food chain.

For question numbers 14-16, 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: The twinkling of stars is due to the fact that refractive index of the earth's atmosphere fluctuates.
Reason: When light propagates from one medium to another its direction of propagation changes.

15. Assertion: Reactivity series is an arrangement of element based on their reactivity.
Reason: Reactivity series is used to separate elements based on their reactivity.

OR

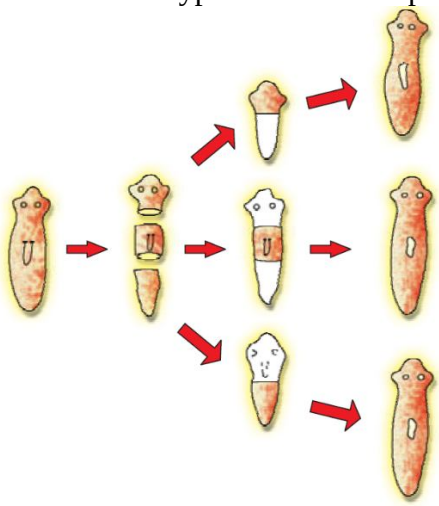
Assertion: Different metals have different reactivities with water and dilute acids.
Reason: Reactivity of a metal depends on its position in the reactivity series.

16. Assertion: Ozone is present in the layer of earth's atmosphere.
Reason: Ozone is a gas released by burning fuels.

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 and answer any four questions from 20(i) to 20(v).

Reproduction is a process by which living organisms are able to produce young ones of their new kind. Living organisms reproduce by two ways - asexual reproduction and sexual reproduction. Asexual reproduction involves the production of an offspring from a single parent without the fusion of gametes. This mostly occurs in unicellular organisms, some plants and certain multicellular organisms. There are various types of asexual reproduction.



(i) The type of reproduction shown in the figure is
(a) budding (b) fragmentation (c) regeneration (d) fission.

(ii) Which of the following is correct example of the process shown in the given figure?
(a) Hydra (b) Planaria (c) Amoeba (d) Both (a) and (b)

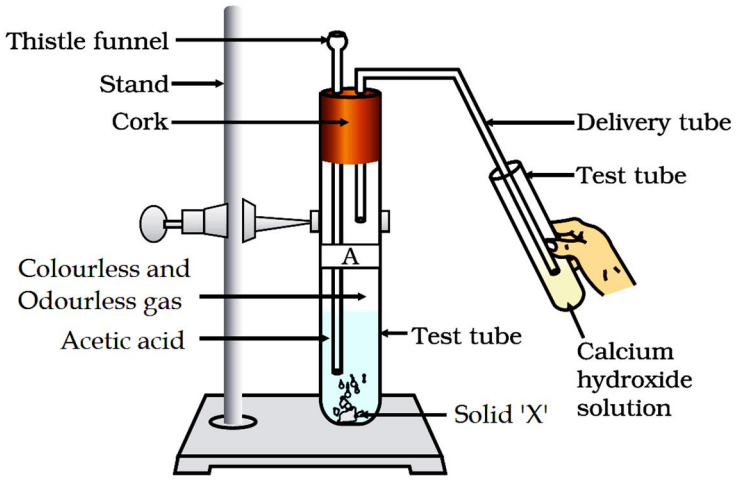
(iii) A feature of reproduction that is common to Amoeba, yeast and bacteria is that
(a) they are all unicellular (b) they are all multicellular
(c) they reproduce only sexually (d) they reproduce asexually.

(iv) Asexual reproduction is
(a) a fusion of specialised cells
(b) a method by which all types of organism reproduce
(c) a method producing genetically identical offspring
(d) a method in which more than one parent are involved.

(v) From the given list of organisms, those which reproduce by the asexual method are:
(i) Aspergillus (ii) Dog (iii) Papaya (iv) Paramecium
(a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii), (iii) and (iv)

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

Acetic acid was added to a solid 'X ' taken in a test tube. A colourless and odourless gas was evolved. The gas was passed through lime water which turned milky. Thistle funnel Colourless and odourless gas Acetic acid Test tube Delivery tube Test tube Limewater (Calcium hydroxide solution) Solid 'X' Cork Stand.



(i) The solid 'X' is
(a) sodium hydroxide (b) sodium bicarbonate
(c) sodium acetate (d) sodium chloride.

(ii) The gas evolved is
(a) CO_2 (b) SO_2 (c) Cl_2 (d) H_2

(iii) When evolved gas is passed through lime water, it turns milky due to formation of
(a) calcium hydroxide (b) calcium bicarbonate
(c) calcium oxide (d) calcium carbonate.

(iv) When excess of carbon dioxide gas is passed through lime water, milkiness disappear due to formation of
(a) $CaCl_2$ (b) $CaCO_3$ (c) $Ca(HCO_3)_2$ (d) $NaHCO_3$

(v) The evolved gas is also produced when metal carbonates react with
(a) magnesium oxide (b) sodium hydroxide
(c) hydrogen chloride (d) zinc sulphate.

19. Read the following and answer any four questions from 18(i)-18(v).

Sample pieces of five metals, A, B, C, D and E are added to the tabulated solutions separately. The results observed are shown in the table given below:

Metals	**Solution**				
	$FeSO_4$	**$CuSO_4$**	**$ZnSO_4$**	**$AgNO_3$**	**$Al_2(SO_4)_3$**
A	No change	No change	No change	A coating on metal	No change
B	Grey deposit	Brown coating	No change	A coating on metal	No change
C	No change	No change	No change	No change	No change
D	No change	--	No change	A coating on metal	No change
E	--	Brown coating	New coating	New coating	No change

Based on the observations recorded in the table answer the following questions:
(i) Which is the most reactive metal?
(a) B (b) C (c) D (d) E

(ii) Which is the least reactive metal?
(a) A (b) C (c) E (d) B

(iii) Activity series of elements is
(a) the arrangement of elements in increasing order of reactivity.
(b) the arrangement of elements in decreasing order of reactivity.
(c) the arrangement of oxides of elements in increasing order of reactivity.
(d) none of these.

(iv) Which of the following metal is least reactive?
(a) Gold (b) Copper (c) Platinum (d) Tin

(v) Decreasing order of reactivity is
(a) A > B > C > D > E (b) B > E > C > D > A
(c) E > B > D > A > C (d) D > C > B > E > A

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

The current in the conductor is directly proportional to the potential difference across the conductor provided physical conditions of the conductor i.e., temperature, length, cross-sectional area and material, does not change.

$$i \propto V$$

Putting the proportionality constant (R), we get $i = V/R$ or $V = iR$, where R is a constant called resistance of conductor

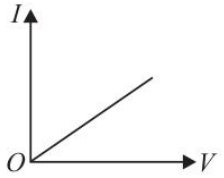
Substance which follow Ohm's law are called ohmic substance or a linear conductor. For ohmic substances, the slope of i versus V graph is a constant. Substances which do not follow Ohm's law are called non-ohmic substance or non-linear conductor. For non-ohmic substances, the slope of i versus V graph is not a constant. A student wants to check experimentally how the resistance of a lamp varies with the length of the wire. Two sets of reading obtained, are shown below.

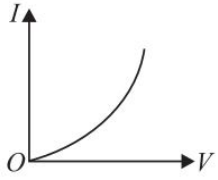
Ammeter reading, I (A)	Voltmeter, V(V)	Resistance, R(Ω)
0.2	0.4	
1.0	3.2	

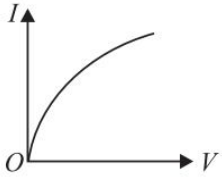
(i) Using the table calculate the resistance of the lamp for different currents.
(a) 1, 2 (b) 2.0, 3.2 (c) 4.2, 5.1 (d) 2.2, 2.8

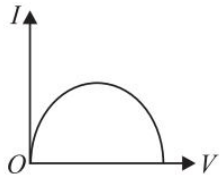
(ii) Before the current flows in the lamp, what is the reading on the voltmeter?
(a) 0 V (b) 0.4 V (c) 3.2 V (d) 0.6 V

(iii) Which of the following I-V graph represents for ohmic conductors?

(a) 

(b) 

(c) 

(d) 

(iv) The electrical resistance of a conductor depends upon
(a) size of conductor (b) temperature of conductor
(c) geometry of conductor (d) all of these.

(v) Slope V-I graph gives
(a) resistivity (b) energy dissipated (c) power (d) resistance

SECTION – B

21. Why is photosynthesis important?

22. What is the role of acid in our stomach?

OR

(a) What is peristaltic movement?
(b) In which part of the digestive system is water absorbed?

23. Define covalent bond. Explain with the help of example.

24. What is an oxidation reaction? Identify the substance which gets oxidised, the substance which gets reduced, the oxidising agent and the reducing agent in the following reaction:

$$Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$$

25. An object of height 6 cm is placed perpendicular to the principal axis of a concave lens of focal length 5 cm. Use lens formula to determine the position, size and nature of the image if the distance of the object from the lens is 10 cm.

26. Draw a labelled circuit diagram showing three resistors R_1, R_2 and R_3 connected in series with a battery (E), a rheostat (Rh), a plug key (K) and an ammeter (A) using standard circuit symbols. Use this circuit to show that the same current flows through every part of the circuit. Also, list two precautions you would observe while performing the experiment.

OR

Two identical resistors of resistance R are connected in series with a battery of potential difference V for time t. The resistors are then connected in parallel with the same battery for the same time t. Compare the heat produced in the two cases.

SECTION – C

27. (i) State four factors on which the strength of magnetic field produced by a current carrying solenoid depends.
(ii) Draw circuit diagram of a solenoid to prepare an electromagnet.

28. What is 'dispersion of white light'? State its cause. Draw a ray diagram to show the dispersion of white light by a glass prism.

OR

State the difference in colours of the sun observed during sunrise/sunset and noon. Give explanation for each.

29. State the reason why carbon can neither form C^{4+} cations nor C^{4-} anions, but forms covalent bonds. Also state reasons to explain why covalent compounds (i) are bad conductors of electricity (ii) have low melting and boiling points.

30. (a) Name one pair of elements in the Mendeleev's periodic table whose positions were not in increasing order of their atomic masses.
(b) If R is the symbol of an element in the third period and third group of Mendeleev's periodic table then what is the formula of its oxide?
(c) Carbon is a non-metal belonging to group 14. Do you find a metal in this group?

31. Differentiate between inherited and acquired traits.

32. Explain determination of sex among human beings, with the help of an illustration.

33. (a) Define contraception. What are the different methods of contraception?
(b) Give three examples of sexually transmitted diseases.

SECTION – D

34. (a) What will happen:
(i) if a lighted candle is brought near the mouth of gas jar containing hydrogen gas?
(ii) if carbon dioxide gas is passed through lime water?
(b) Give one example each of the reaction involving combination of
(i) an element with another element
(ii) an element with a compound
(iii) a compound with another compound.

35. (i) The image of a candle flame placed at a distance of 30 cm from a spherical lens is formed on a screen placed on the other side of the lens at a distance of 60 cm from the optical centre of the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 3 cm, find the height of its image.
(ii) How should a ray of light be incident on a rectangular glass slab so that it comes out from the opposite side of the slab without being displaced?

OR

(i) Define focal length of a lens.
(ii) A divergent lens has a focal length of 30 cm forms the image of an object of size 6 cm on the same side as the object at a distance of 15 cm from its optical centre. Use lens formula to determine the distance of the object from the lens and the size of the image formed.
(iii) Draw a ray diagram to show the formation of image in the above situation.

36. Describe the components of the transport system in human beings. What are the functions of these components?

OR

Describe the process of urine formation in the kidney.