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SAMPLE TEST PAPER 04 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. Explain why carbon forms compounds mainly by covalent bonds?

OR

Briefly explain two main reasons why carbon forms such a large number of compounds.

2. Define pollination.

OR

What do you mean by cross pollination?

3. A teacher provided acetic acid, water, lemon juice, aqueous solution of sodium hydrogen carbonate and sodium hydroxide to students in the school laboratory to determine the pH values of these substances using pH papers. One of the students reported the pH values of the given substances as 3, 12, 4, Band 14 respectively. Which one of these values is not correct? Write its correct value stating the reason.

4. What is baking soda used for?

5. Which of these statements is incorrect? Give reasons.
(a) Sugarcane juice and water are mixed and heated to form sweet liquid called molasses.
(b) Breakdown of complex substances into simpler substances by anaerobic bacteria is called fermentation.
(c) Glucose and fructose are the final products of fermentation.
(d) Zymase converts glucose and fructose into ethanol and carbon dioxide.

6. A, B and C are three elements which undergo chemical changes according to following equations:

a. $A_2O_3 + 2B \rightarrow B_2O_3 + 2A$

b. $3CSO_4 + 2B \rightarrow B_2(SO_4)_3 + 3C$

c. $3CO + 2A \rightarrow A_2O_3 + 3C$

Which of these metals is most reactive? Give reason to support your answer.
(a) A (b) B (b) C (d) All of these

7. Why do cricketers complain of cramps in their muscles during playing?

OR

Where does the digestion of fat take place in our body?

8. Why do acids not show acidic behaviour in the absence of water?

9. Show electron dot structure for the transfer of electrons between the atoms during the formation of magnesium oxide.

OR

Why ionic compounds do not conduct electricity in their solid state but conduct electricity in their molten or aqueous solution state?

10. What is the role of decomposers in the ecosystem?

OR

What will happen if we kill all the organisms in one trophic level?

11. Give reasons why acquired characters are not inherited?

12. How does Planaria reproduce? Is this method sexual or asexual?

13. What is an ecosystem?

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): Sodium is a metal whereas sulphur is a non-metal.
Reason (R): From left to right metallic character decreases.

15. Assertion (A): Urinary bladder and ureters are lined by transitional epithelium.
Reason (R): Ureters carry the urine to urinary bladder where it is stored temporarily.

OR

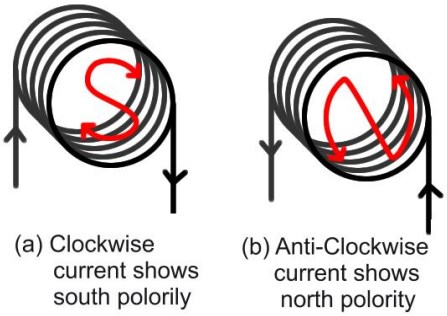
Assertion (A): The effect of root pressure in transport of water is more important at night.
Reason (R): During day, stomata is open, transpiration takes place which help in transport of water.

16. Assertion (A): Chemicals and toxins accumulate more and more as you move up the food chain.
Reason (R): Anything that gets into biological tissue, that is not normally there, has the potential to accumulate and magnify.

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 17 (i) to 17 (v):

The polarity of ends of current carrying solenoids depends on the direction of current flowing and is given by clock-rule. When an end of solenoid is seen from the front side and if the current flowing appears anticlockwise, then this end will be north-pole and the other end will be south-pole, but if the current is clockwise, then this end will be south-pole and the other end will be north-pole.



(a) Clockwise current shows south polorily

(b) Anti-Clockwise current shows north polority

(i) The correct statement is:
(a) If current in wire is vertically upward, the magnetic field lines are clockwise.
(b) If current in wire is vertically downwards the magnetic field lines are anticlockwise.
(c) If current in wire is vertically upward, the magnetic field lines are anticlockwise.
(d) None of these.

(ii) The direction of magnetic field in a current carrying solenoid is determined by:
(a) Right hand thumb rule (b) Left hand thumb rule
(c) Right hand screw rule (d) Maxwell's palm rule

(iii) To find out N-pole in solenoid, we will use:
(a) galvanometer (b) compass (c) bar magnet (d) horse-shoe magnet

(iv) Strength of magnetic field inside the solenoid depends on:
(a) strength of current (b) number of turns
(c) nature of core material (d) all of these

(v) If we make the current too large in the solenoid, what will happen?
(a) Magnetic field increased (b) Solenoid gets demagnetised
(c) Solenoid may burnt out (d) None of these

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

Rear view mirror is a device that allows the driver to see rear ward. It usually fmds its place at the top of windscreen inside the cabin. This device is one of the most basic but essential safety devices in the vehicle. It provides assistance to the driver during overtaking, parking in reverse gear etc. Generally, vehicles also have a pair of mirrors attached to the body from outside. They are popular as 'side mirrors' or Outer Rear View Mirrors (ORVM) which serve the same purpose. Almost all modern cars mount their side mirrors on the doors-normally at A-pillar rather than the wings (the portion of the body above the wheel well).

(i) For a real object, which of the following can produce a real image?
(a) Plane mirror (b) Concave mirror (c) Concave mirror (d) Convex mirror

(ii) An object at a distance of +15 cm is slowly moved towards the pole of a convex mirror. The image will get...

(a) shortened and real (b) enlarged and real
(c) enlarge and virtual (d) diminished and virtual

(iii) A convex mirror is used:

(a) by a dentist (b) for shaving
(c) as a rear view mirror in vehicles (d) as a light reflector for obtaining a parallel beam of light

(iv) The word 'AMBULANCE' is written on the vehicle as:

(a) ECNALUBMA (b) ƎƆИAJUBMA
(c) AMBULAИƆƎ (d) None of these

(v) Mark the correct statement:

(a) Convex mirror conform images of objects spread over a large area.
(b) Convex mirrors are used by dentist.
(c) In convex mirror image is formed larger in size, erect and real.
(d) Convex mirror forms real image.

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

At the teenage some hormonal changes occur in human body such as thick hair growing in armpits and the genital area between the thighs. The skin frequently becomes oily and we might begin to develop pimples. We begin to be conscious and aware for the changes occurring like menstruation cycle in females, voice changes in males and from the same age capability to fertile starts.

(i) In human beings, the fertilisation occurs in the:
(a) Uterus (b) Ovaries (c) fallopian tubes (d) vagina

(ii) The embryo in humans gets nutrition from the mother's blood with the help of a special tissue called:
(a) Placenta (b) Villi (c) Uterus (d) Womb

(iii) In human males, the testes lie in the scrotum, because it helps in the:
(a) process of mating (b) formation of sperms (c) easy transfer of gametes (d) secretion of oestrogen

(iv) Which among the following diseases is not sexually transmitted?
(a) Syphilis (b) Influenza (c) HIV-AIDS (d) Gonorrhoea

(v) Which of the following method of contraception protects from acquiring sexually transmitted diseases?
(a) Surgery (b) Condoms (c) Copper-T (d) Oral-pills

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

All metals do not react with oxygen at the same rate. Different metals show different reactivities towards oxygen. Almost all metals combine with oxygen to form metal oxides. Metal oxides are basic in nature. But some metal oxides, such as aluminium oxide, zinc oxide, etc show both acidic as well as basic behaviour. Most metal oxides are insoluble in water but some like Sodium oxide and potassium oxide dissolve in water to produce alkalis.

(i) Arrange the metals in the correct order of their reactivity:

(a) Mg > Al > Zn > Fe (b) Al > Mg > Fe > Zn
(c) Mg > Zn > Al > Fe (d) Al > Fe > Zn > Mg

(ii) Why does the magnesium ribbon need to be cleaned before burning it in air?
(a) To increase its efficiency.
(b) To remove the oxide layer from it
(c) To decrease its efficiency
(d) All of these

(iii) What is the reason for the surface of aluminium turns into dull colour after few days as shown in the figure?

(a) Due to the formation of a stable aluminium oxide layer.
(b) Due to the reaction with atmospheric dirt particles.
(c) Due to its ductile nature.
(d) None of these.

(iv) Why it is necessary to keep the sodium immersed in kerosene oil?
(a) Sodium reacts vigorously with the oxygen and water producing a lot of heat/fire.
(b) Sodium reacts with kerosene to produce by products.
(c) Sodium is very less reactive metal.
(d) None of these.

(v) Aluminium oxide reacts in the following manner with bases. The resultant product is:

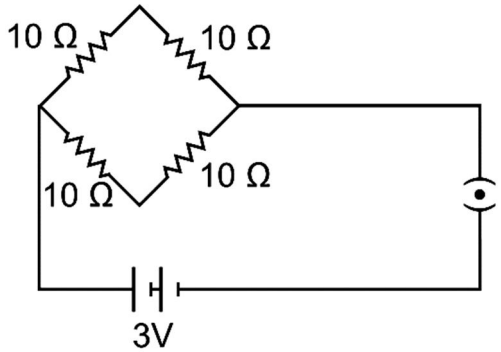
$Al_2O_3 + 2NaOH \rightarrow$

(a) $2A1Cl_3 + 3H_2O$
(b) $2NaAlO_2 + H_2O$
(c) $Al_2O_3 + H_2O$
(d) None of these.

SECTION – B

21. Give two examples of decomposers. State their important role in nature.

22. Find the current drawn from the battery by the network of your resistances shown in the figure.



23. (i) Draw magnetic field lines of a bar magnet. "Two magnetic field lines never intersect each other." Why?
(ii) An electric oven of 1.5 kW is operated in a domestic circuit (220 V) that has a current rating of 5 A. What result do you expect in this case? Explain.

24. What is double displacement reaction? Give two points of difference between displacement and double displacement reaction.

OR

Identify the type of chemical reaction in the following statements and define each of them.
(i) Digestion of food in the body
(ii) Heating of manganese dioxide with aluminium powder

25. The position of five elements in the periodic table are shown below:

	Group 1	**Group 2**	**Group 15**	**Group 16**
Period 1		A		B
Period 3	C		D	E

(i) What are the numbers of valence electrons in B?
(ii) Name the element which have smallest atomic radius.
(iii) Name the element that will form basic oxide.

OR

(i) Name the element with atomic number 17. Write its electronic configuration.
(a) To which period does it belong.
(b) To which group does it belong.
(ii) Write down two drawbacks of Newland's law of octaves.

26. With the help of suitable examples explain why certain characters of traits earned by people during their lifetime are not passed onto the next generation. How can these characters be passed on?

SECTION – C

27. (i) What is presbyopia? State its cause. How is it corrected?
(ii) What do you mean by Tyndall effect? Give an example of Tyndall effect. Which property of light is responsible for this effect.
(iii) Why does the sun appear reddish early in the morning? Explain with the help of a labelled diagram.

28. Give reasons:
(i) Sometimes we cough while swallowing food.
(ii) Stem also respire along with leaves of plants.
(iii) Diameter of afferent arteriole is bigger than efferent arteriole.

OR

(i) List three characteristics of lungs which makes it an efficient respiratory surface.
(ii) How are alveoli designed to maximise the exchange of gases?
(iii) During breathing cycle, what is the advantage of residual volume of air in the lungs?

29. Nitrogen (atomic number 7) and phosphorus (atomic number 15) belong to group 15 of the periodic table. Write their electronic configuration. Which of these will be more electronegative and why?

30. (i) A coil of insulated wire is connected to a galvanometer. What would be seen if a bar magnet with its South pole towards one face of the coil is:
(a) Moved quickly toward it
(b) Moved quickly away from it
(c) Placed near its one face
These activities are then repeated with North pole of the magnet. What will be the observations?
(ii) Name and define the phenomenon involved in the given activities.
(iii) Name the rule which can determine the direction of current in each case.

31. Define a chemical reaction. State four observations which help us to determine that, a chemical reaction has taken place. Write one example of each observation with a balanced chemical equation.

32. What is vegetative propagation? State two advantages and two disadvantages of this method.

33. (i) What is (a) the highest, (b) the lowest total resistance that can be secured by combinations of four coils of resistance 4 Ω, 8 Ω, 12 Ω, 24 Ω?

(ii) Derive the equation for resistivity. On what factors does the resistance of a conductor depend?

SECTION – D

34. At what distance from the concave lens of focal length 20 cm, should a 6 cm tall object be placed so that it forms an image at 15 cm from the lens? Also, determine the size of the image formed.

OR

A concave lens of focal length 15 cm forms an image 10 cm from the lens. How far is the object placed from the lens? Draw the ray diagram.

35. How do Mendel's experiments show that the:
(i) Traits may be dominant or recessive
(ii) Traits are inherited independently.

OR

(i) What are dominant and recessive traits?
(ii) Is it possible that a trait is inherited but may not be expressed in the next generation? Give a suitable example to justify this statement.
(iii) What are homologous structures? Give an example.
(iv) "The sex of a new born child is a matter of chance and none of the parents may be considered responsible for it." Justify this statement with the help of a flow chart showing sex-determination in human beings.

36. (i) What is reactivity series? How does the reactivity series of metals help in predicting the relative activities of various metals?
(ii) (a) Why is white phosphorus kept immersed under water?
(b) With the help of examples, describe how metal oxides differ from non-metal oxides.

OR

(i) Write electron dot diagram for chlorine (At. No. 17) and calcium (At. No. 20). Show the formation of calcium chloride by transfer of electrons.
(ii) Identify the nature of calcium chloride and explain three physical properties of such compound.