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SAMPLE TEST PAPER 05 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 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.

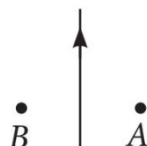
SECTION – A

1. A metal X is placed in the aqueous solution of a sulphate of metal Y. After some time, it is observed that metal Y is deposited on metal X. Which metal is more reactive out of the two?
2. A silver spoon is kept immersed in an aqueous copper sulphate solution. What change will take place?
3. Which of the following is acidic in nature?
(a) Lime juice (b) Human blood (c) Lime water (d) Antacid
4. An electric appliance takes 5 A from a 220 V line. Determine its power and the energy consumed in 2 hours.
5. Define one ampere.
6. How is speed of light in a medium related to its refractive index?

OR

What is the largest value of refractive index?

7. In which medium the speed of light is lower-glass or water?
8. A current is flowing in upward direction on the plane of paper. Find the direction of magnetic field at A and B.



9. The image formed by a convex lens is always real. Is it true?

OR

What is the cause of refraction?

10. What is the dental formula of milk teeth in humans?

11. Name the structural and functional unit of kidney.

OR

In which form birds excrete waste products?

12. Write two causes of depletion of ozone layer.

OR

What do you mean by biological magnification?

13. Write any four examples of abiotic components of an ecosystem.

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:** Ethane is first member of the alkane homologous series.

Reason: A homologous series can be represented by a general formula.

15. **Assertion:** Herbivores are called first order consumers.

Reason: Lion is a top carnivore.

16. **Assertion:** Respiration is an exothermic process.

Reason: The glucose combines with oxygen in the cells of our body and provides energy.

OR

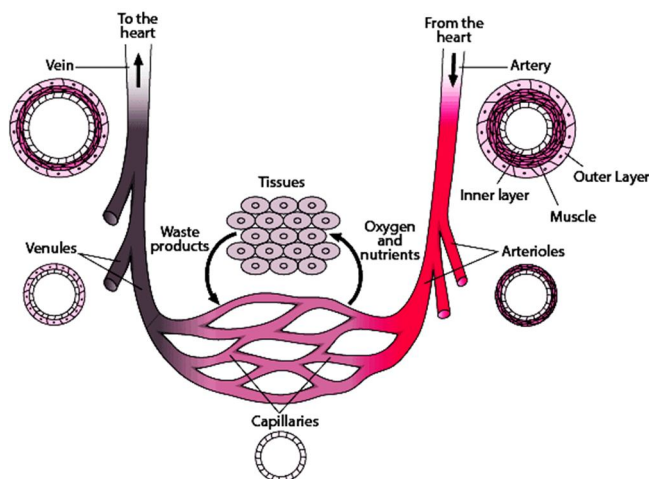
Assertion: Following reaction of iron is a redox reaction. $4\text{Fe} + 3\text{O}_2 \rightarrow 4\text{Fe}^{3+} + 6\text{O}^{2-}$.

Reason: The metallic iron is oxidised to Fe^{3+} and O_2 is reduced to oxide ion.

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 16(i) to 16(v).

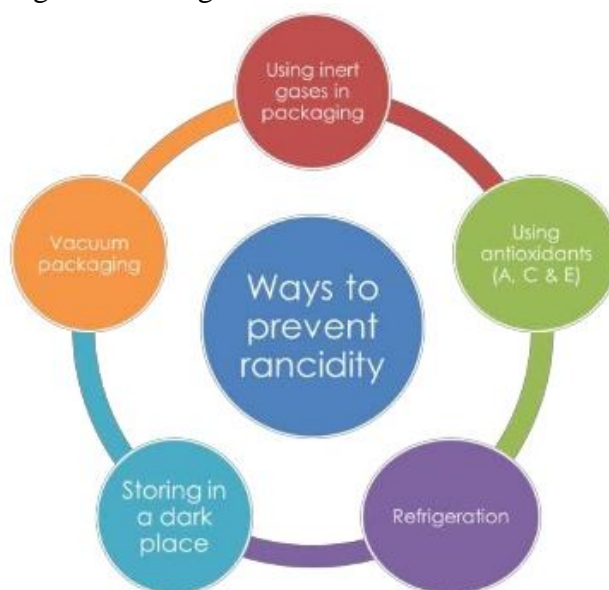
The tubes – blood vessels - Arteries are the vessels which carry blood away from the heart to various organs of the body. Since the blood emerges from the heart under high pressure, the arteries have thick, elastic walls. Veins collect the blood from different organs and bring it back to the heart. They do not need thick walls because the blood is no longer under pressure, instead they have valves that ensure that the blood flows only in one direction. On reaching an organ or tissue, the artery divides into smaller and smaller vessels to bring the blood in contact with all the individual cells. The smallest vessels have walls which are one-cell thick and are called capillaries. Exchange of material between the blood and surrounding cells takes place across this thin wall. The capillaries then join together to form veins that convey the blood away from the organ or tissue.



- (i) A blood vessel which carries blood back to the heart is :
 (a) artery (b) vein (c) capillary (d) platelet
- (ii) The blood vessel which carries oxygenated blood from the lungs to the heart is :
 (a) main artery (b) pulmonary artery (c) main vein (d) pulmonary vein
- (iii) The smaller vessels in which arteries are divided after entering the body organs are called
 (a) cytokinesis (b) granum (c) centrioles (d) arterioles
- (iv) After entering into the tissues, the arteries are divided into
 (a) aorta (b) atrium (c) capillaries (d) veins
- (v) The blood vessels in which there are no valves includes
 (a) veins and capillaries (b) capillaries and arteries
 (c) arteries and nerves (d) veins and arteries

18. Read the following and answer any four questions from 17(i) to 17(v).

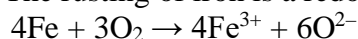
Oxidation has damaging effect on metals as well as on food. The damaging effect of oxidation on metal is studied as corrosion and that on food is studied as rancidity. The phenomenon due to which metals are slowly eaten away by the reaction of air, water and chemicals present in atmosphere, is called corrosion. For example, iron articles are shiny when new, but get coated with a reddish brown powder when left for sometime. This process is known as rusting of iron. Rancidity is the process of slow oxidation of oil and fat (which are volatile in nature) present in the food materials resulting in the change of smell and taste in them.



- (i) Rancidity can be prevented by
 (a) adding antioxidants (b) packaging oily food in nitrogen gas
 (c) both (a) and (b) (d) none of these.
- (ii) Combination of phosphorus and oxygen is an example of
 (a) oxidation (b) reduction (c) rancidity (d) none of these.
- (iii) A science teacher wrote the following statements about rancidity:
 (I) When fats and oils are reduced, they become rancid.
 (II) In chips packet, rancidity is prevented by oxygen.
 (III) Rancidity is prevented by adding antioxidants.
 Select the correct option.
 (a) (I) only (b) (II) and (III) only
 (c) (III) only (d) (I), (II) and (III)

(iv) Two statements are given below regarding rusting of iron.

(I) The rusting of iron is a redox reaction and reaction occurs as,



(II) The metallic iron is oxidised to Fe^{2+} and O_2 is reduced to O^{2-} .

Select the correct statement(s).

(a) I only (b) II only (c) Both I and II (d) None of these

(v) Which of the following measures can be adopted to prevent or slow down rancidity?

(I) Food materials should be packed in air tight container.

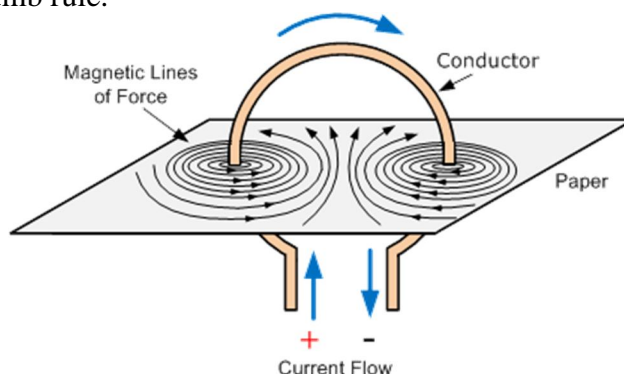
(II) Food should be refrigerated.

(III) Food materials and cooked food should be kept away from direct sunlight.

(a) Only II and III (b) Only I and III (c) Only II and III (d) I, II and III

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

When a current is passed through the circular loop of wire, a magnetic field lines near the coil are nearly circular and concentric. At the centre of the circular loop, the magnetic field lines are straight. The strength of the magnetic field produced by a current-carrying circular coil (or circular wire) depends on (i) current flowing through the coil. (ii) radius of the circular coil. (iii) number of turns of wire in the circular coil. The direction of the field lines can be found by applying right-hand thumb rule.



(i) A long horizontal power line is carrying a current of 100 A in the east-west direction. What is the direction of magnetic field at a point 1.0 m below it?

(a) North-South (b) East-West (c) South-East (d) North-West

(ii) State the pattern of magnetic field lines for current carrying circular conductor.

(a) Magnetic field lines will be concentric circles to any point of the circular loop

(b) At centre, the field lines appear straight

(c) Both of these

(d) None of these

(iii) If a current carrying straight conductor is placed in west-east direction, then find the direction of the force experienced by the conductor due to earth's magnetic field.

(a) Upward (b) Downward (c) Can't determined (d) Same as of current

(iv) According to right-hand thumb rule direction of the curl of fingers of the right hand gives the

(a) electric field lines (b) magnetic field lines

(c) direction of magnetic field (d) direction of current

(v) In case of circular loop carrying current, the strength of magnetic field is

(a) constant everywhere

(b) stronger inside the loop than outside the loop

(c) weaker inside the loop than outside the loop

(d) none of these

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

Mirror formula is a relation between object distance (u), image distance (v) and focal length (f) of a spherical mirror.

It can be written as $\frac{1}{u} + \frac{1}{v} = \frac{1}{f} = \frac{2}{R}$, where R is the radius of curvature of the mirror.

This formula is valid in all situations for all spherical mirrors for all positions of the object.

Consider the case, in which a mirror forms a real image of height 4 cm of an object of height 1 cm placed 20 cm away from the mirror.

(i) The distance from the object to its image is

(a) 20 cm (b) 80 cm (c) 60 cm (d) 70 cm

(ii) The focal length of mirror is

(a) -16 cm (b) 12 cm (c) -15 cm (d) 10 cm

(iii) The radius of curvature of the mirror is

(a) -16 cm (b) -14 cm (c) -30 cm (d) -32 cm

(iv) The magnification of the image is

(a) 3 (b) -6 (c) -4 (d) 8

(v) At what distance must an object be placed from mirror in order that a real image double its size may be obtained?

(a) -24 cm (b) 32 cm (c) -40 cm (d) 45 cm

SECTION – B

21. What is methane? Draw its electron dot structure. Name the type of bonds formed in this compound.

22. List the fundamental steps in the operation of an ecosystem.

OR

Suggest few measures for controlling carbon dioxide levels in the atmosphere.

23. Some traits are acquired during lifetime of an individual. Will these traits or characters be inherited and passed on to the next generation of the individual? Give reason.

24. Name the type of reaction for the following: (i) Vegetable matter changing into compost. (ii) Burning of natural gas.

25. Draw a ray diagram to show the refraction of light through a triangular glass prism and mark angle of deviation on it.

OR

What are the conditions for the formation of a rainbow?

26. Given n resistors each of resistance R, how will you combine them to get the

(i) maximum effective resistance and

(ii) minimum effective resistance?

What is the ratio of the maximum to minimum resistance?

SECTION – C

27. What do you understand by the terms - Anuria, Haematuria, Dysuria, Diuresis, Polyuria and Glycosuria?

OR

Differentiate between light and dark phase of photosynthesis.

28. (i) Give five functions of blood.

(ii) "Fishes show single circulation". Explain.

29. Define the following terms : (i) Inheritance (ii) Heredity (iii) Trait (iv) Variations

30. Answer the following:

(i) Why is plaster of Paris written as $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$? How is it possible to have half a water molecule attached to CaSO_4 ?

(ii) Why is sodium hydrogen carbonate an essential ingredient in antacids?

(iii) Name the acid present in the following: (a) Tomato (b) Tamarind

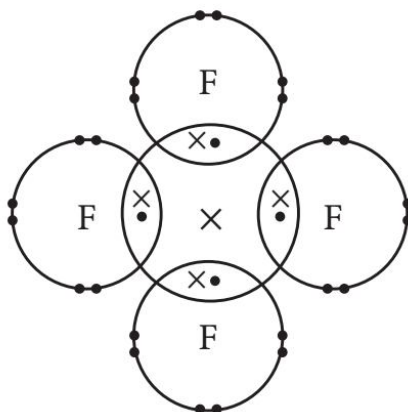
31. Old oil paintings get blackened over the years due to reactions with pollutant gases in the air.

(i) Name the gas responsible for discolouration of the paintings.

(ii) Give the formula of the black substance formed.

(iii) How can the original colour of paintings be restored?

32. The diagram below shows the electron arrangement in a compound formed between element X and fluorine. (i) What is the formula of this compound? (ii) Is this an ionic or covalent compound? Give your reason.



33. What is Rayleigh scattering? Give essential condition for the same.

SECTION – D

34. (i) Read the following statements and identify the elements :

(a) An element with atomic number 12 and forms XCl, type of compound.

(b) Metal used in making cans and member of group 14.

(c) A lustrous non-metal which has 7 electrons in its outermost shell.

(ii) Write the names given to the vertical columns and horizontal rows in the Modern Periodic Table. How does the metallic character of elements vary on moving down a vertical column? How does the size of atomic radius vary on moving left to right in a horizontal row? Give reason in support of your answer in the above two cases.

OR

- (i) Name the gas evolved when sodium hydrogen carbonate reacts with dilute hydrochloric acid. How will you test the presence of this gas?
- (ii) A substance 'X', which is an oxide of a metal is used extensively in the cement industry. The element present in the substance X is an important constituent of our bones. On treatment with water, it forms a solution which turns red litmus blue. Identify 'X' and also write the equation for its chemical reaction with water.
- (iii) Why is concentrated acid added to water and not water to concentrated acid to make dilute solution of acid?

- 35.** Briefly explain an activity to plot the magnetic field lines around a straight current carrying conductor. Sketch the field pattern for the same, specifying current and field directions. What happens to the field,
- (i) if the strength of the current is decreased?
 - (ii) if the direction of the current is reversed?

OR

- (i) Name and state the rule used for determination of direction of induced current produced in a conductor due to a changing magnetic field and give one practical application of this phenomenon in everyday life.
- (ii) In what respect does the construction of an AC generator differ from that of a DC generator?

- 36.** (a) Suppose there is no meiosis and the gametes are formed by mitotic divisions. What kind of situation do you expect under such circumstances?
- (b) Can organism with fewer chromosomes reproduce more easily than organisms with more number of chromosomes?

