

**PRE BOARD EXAMINATION II 2023-24**  
**CLASS: 10**  
**SUBJECT: SCIENCE (086)**  
**SET: 2**

Roll No: 10B31

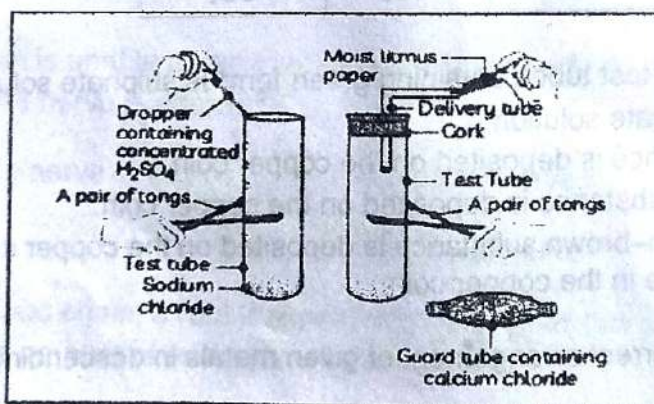
M.M.: 80

TIME: 3 hrs

**General Instructions:**

- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Q1. The change in colour of the moist litmus paper in the given set up is due to



- i. presence of acid
  - ii. presence of base
  - iii. presence of  $H^+(aq)$  in the solution
  - iv. presence of Litmus which acts as an indicator
- (a) i and ii  
(b) Only ii  
(c) Only iii  
(d) Only iv.

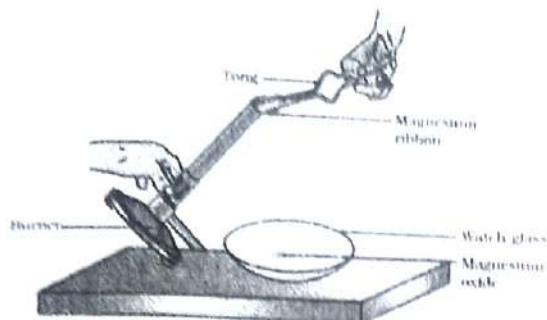
Q2. In the redox reaction



- (a)  $MnO_2$  is reduced to  $MnCl_2$  &  $HCl$  is oxidized to  $H_2O$   
(b)  $MnO_2$  is reduced to  $MnCl_2$  &  $HCl$  is oxidized to  $Cl_2$   
(c)  $MnO_2$  is oxidized to  $MnCl_2$  &  $HCl$  is reduced to  $Cl_2$   
(d)  $MnO_2$  is oxidized to  $MnCl_2$  &  $HCl$  is reduced to  $H_2O$



Q3.



Which of the following is the correct observation of the reaction shown in the above setup?

- (a) Brown powder of Magnesium oxide is formed.
- (b) Colourless gas which turns lime water milky is evolved.
- (c) Magnesium ribbon burns with brilliant white light.
- (d) Reddish brown gas with a smell of burning Sulphur has evolved.

Q4. With the reference to four gases  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{Cl}_2$  and  $\text{O}_2$ , which one of the options in the table is correct?

Option	Acidic oxide	Used in treatment of water	Product of respiration	Product of incomplete combustion
<input checked="" type="checkbox"/> (a)	$\text{CO}$	$\text{Cl}_2$	$\text{O}_2$	$\text{CO}$
(b)	$\text{CO}_2$	$\text{Cl}_2$	$\text{CO}_2$	$\text{CO}$
(c)	$\text{CO}_2$	$\text{O}_2$	$\text{O}_2$	$\text{CO}_2$
(d)	$\text{CO}$	$\text{O}_2$	$\text{CO}_2$	$\text{CO}_2$

Q5. On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution

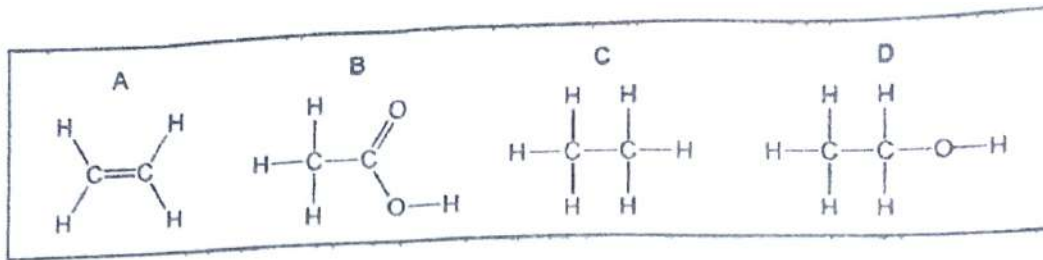
- (a) Turns blue, and a grey substance is deposited on the copper coin.
- (b) Turns colourless and a grey substance is deposited on the copper coin.
- (c) Turns colourless and a reddish-brown substance is deposited on the copper coin.
- (d) Remains green with no change in the copper coin.

Q6. Which of the following is the correct arrangement of given metals in descending order of their reactivity:

Zinc, iron, magnesium, sodium

- (a) Zinc > iron > magnesium > sodium
- (b) Sodium > zinc > magnesium > iron
- (c) Sodium > magnesium > iron > zinc
- (d) Sodium > magnesium > zinc > iron

Q7. The formulae of four organic compounds are shown below. Choose the correct option



- (a) A and B are unsaturated hydrocarbons  
 (b) C and D are saturated hydrocarbons  
 (c) Addition of hydrogen in presence of catalyst changes A to C  
 (d) Addition of potassium permanganate changes B to D

Q8. A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy exercise session. This happened due to:

- (a) Lack of carbon dioxide and formation of pyruvate.  
 (b) Presence of oxygen and formation of ethanol.  
 (c) Lack of oxygen and formation of lactic acid.  
 (d) Lack of oxygen and formation of carbon dioxide

Q9. In humans, the gene for black hair colour is B and gene for brown hair colour is b. Identify the correctly matched genotype and phenotype.

Phenotype	Genotype
(a) Black	bb
<del>(b) Black</del>	BB
(c) Brown	Bb
(d) Brown	BB

Q10. A man is unable to remove his hand when he feels a stimulus of very high temperature. Which of his nerve is affected?

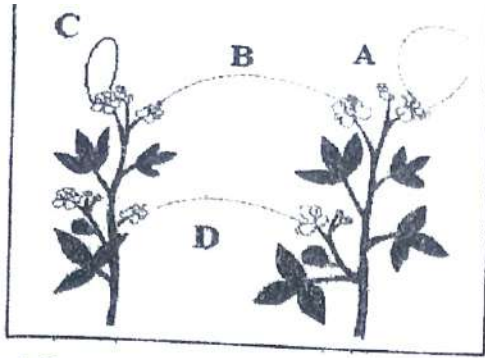
- (a) Sensory nerve                      (b) Motor nerve  
 (c) Brain                                  ~~(d) Spinal nerve~~

Q11. In a food chain, a rabbit at second trophic level has 500J of energy. A snake eats it. What is the amount of energy available to snake?

- (a) 5000 J                                  (b) 500 J  
~~(c) 50 J~~                                    (d) 5 J

Q12. The diagram shown below depicts pollination. Choose the options that will show a maximum variation in the offspring.



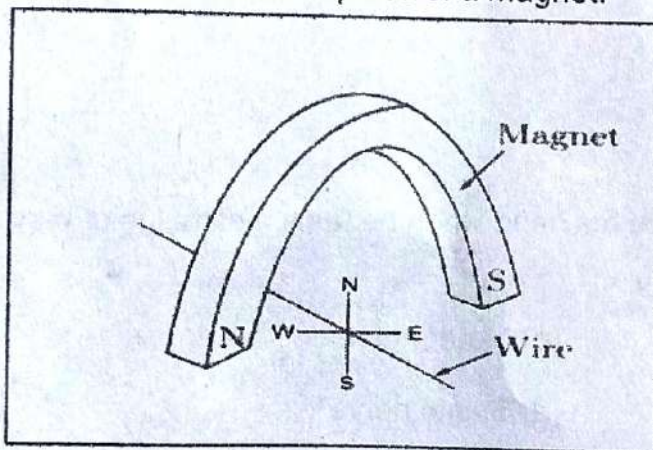


- (a) A, B and C
- ~~(b) B and D~~
- (c) B, C and D
- (d) A and C

Q13. A complete circuit is left on for several minutes, causing the connecting copper wire to become hot. As the temperature of the wire increases, the electrical resistance of the wire

- (a) Decreases.
- (b) Remains the same.
- ~~(c) Increases.~~
- (d) Increases for some time and then decreases .

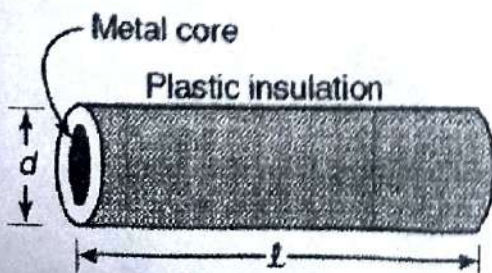
Q14. A copper wire is held between the poles of a magnet.



The current in the wire can be reversed. The pole of the magnet can also be changed over. In how many of the four directions shown can the force act on the wire?

- (a) 1
- ~~(b) 2~~
- (c) 3
- (d) 4

Q15.



Plastic insulation surrounds a wire having diameter  $d$  and length  $l$  as shown above. A



decrease in the resistance of the wire would be produced by an increase in the

- (a) length  $l$  of the wire
- (b) diameter  $d$  of the wire
- (c) temperature of the wire
- (d) thickness of the plastic insulation

Q16. Which of the following pattern correctly describes the magnetic field around a long straight wire carrying current?

- (a) Straight lines perpendicular to the wire.
- (b) Straight lines parallel to the wire.
- (c) Radial lines originating from the wire.
- (d) Concentric circles centered around the wire.

Q. no. 17 to 20 are Assertion - Reasoning based questions.

These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true and R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is False but R is true

Q17. **Assertion:** Oils containing unsaturated fatty acids should be chosen for cooking.

**Reason:** carbon burns in oxygen to give carbon dioxide along with the release of heat and light. ✓

Q18. **Assertion:** Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled.

**Reason:** Cellular DNA is the information source for making proteins in the cell. d

Q19. **Assertion:** Amphibians can tolerate mixing of oxygenated and deoxygenated blood.

**Reason:** Amphibians are animals with two chambered heart a

Q20. **Assertion:** On freely suspending a current – carrying solenoid, it comes to rest in Geographical N-S direction.

**Reason :** One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole, just like a bar magnet. a

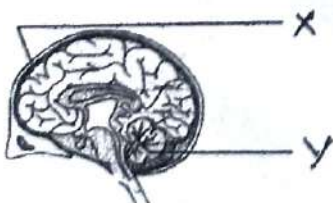
### SECTION B

Q21. . Describe an activity to find out the conditions under which iron rusts.

Q22. (a) If a ripened fruit is kept in a basket then what will happen to rest of the fruits?

(b) Why is ABA known as stress hormone?

23. Identify X and Y, write their respective functions.



OR

(a) What is the site of digestion of fats in humans?

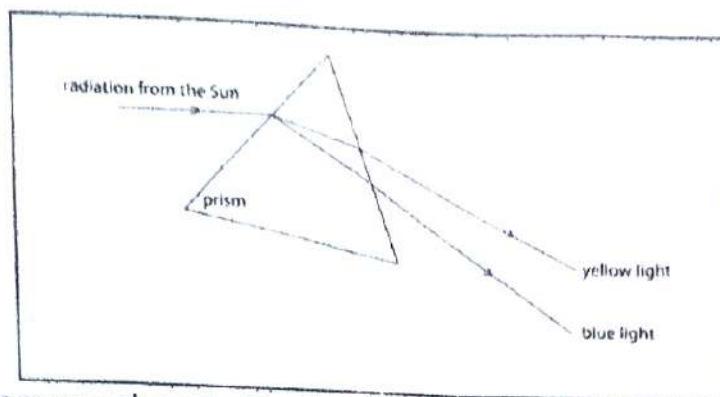
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(b) Name the enzyme that digests fats mention the end products of fat digestion

24. (a) How the nitrogenous waste products from the blood pass into dialysing fluid?

(b) Which are the filtration units in kidney?

Q25.



State the phenomena observed in the above diagram. Explain with reference to the diagram, which of the two lights mentioned above will have the higher wavelength?

OR

How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.

Q26. A lot of waste is generated in neighborhood. However, almost all of it is biodegradable. What impact will it have on the environment or human health?

### SECTION C

Q27. i)



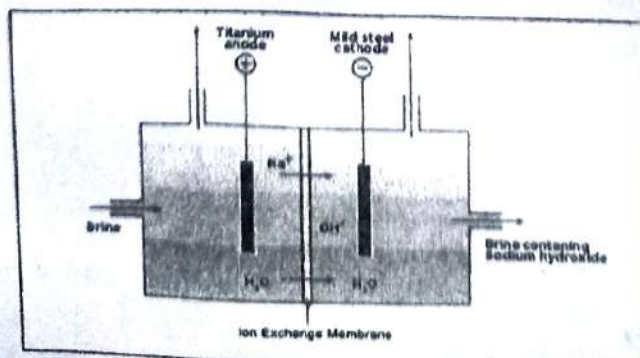
ii)



(a) Identify and name the types of reaction mentioned above in (i) and (ii).

(b) Give one example for each type in the form of a balanced chemical equation.

Q28.



(a) Identify the gasses evolved at the anode and cathode in the above



experimental set up.

- (b) Name the process that occurs. Why is it called so?
- (c) Illustrate the reaction of the process with the help of a chemical equation.

OR

Salt A is commonly used in bakery products on heating converted into another salt B, which is used to remove the hardness of water and a gas C is removed. The gas C when passed through lime water, turns it milky.

- (a) Identify A, B and C.
- (b) Write balanced chemical equation for heating of A.
- (c) Write balanced chemical equation for reaction of gas C with lime water.

Q29. Give reason for the following:

- a. Hydrogen gas is not evolved when most of the metals react with nitric acid.
- b. Calcium starts floating on reaction with water.
- c. Aluminium is a reactive metal but is still used for packing food articles.

Q30.(a) Identify the organism from the following food chain which will have maximum and minimum concentration of chemicals in its body. Arrange them according to their trophic level:

Peacock ,frog ,snake, grasshopper

(b) What is the role of decomposers in the ecosystem?

Q31. Give reason for the followings:

- (a) Sun appears red at the time of sunrise and sunset.
- (b) Stars twinkle but planets do not.
- (c) White light splits into seven colours when passed through a glass prism.

Q32. A student fixes a white sheet of paper on a drawing board. He places a bar magnet in the center and sprinkles some iron filings uniformly around the bar magnet. Then he taps gently and observes that iron filings arrange themselves in a certain pattern.

- (a) Why do iron filings arrange themselves in a particular pattern?
- (b) Which physical quantity is indicated by the pattern of field lines around the bar magnet?
- (c) State any two properties of magnetic field lines.

Q33. Rohit wants to have an erect image of an object using a converging mirror of focal length 40 cm.

- (a) Specify the range of distance where the object can be placed in front of the mirror.

Justify.

- (b) Draw a ray diagram to show image formation in this case.
- (c) State one use of the mirror based on the above kind of image formation.

#### SECTION D

Q34. An organic acid X is a liquid which often freezes during winter time in cold countries, has the formula  $C_2H_4O_2$ . On warming with ethanol in the presence of a few drops of concentrated sulphuric acid, a compound Y with a sweet smell is formed.

- (a) Identify X and Y
- (b) Write balanced chemical equation for the reaction involved.
- (c) Name the reaction and write two uses of compound Y.
- (d) How would you distinguish experimentally between an alcohol and a



carboxylic acid. Write balanced chemical equations for the test involved.

**OR**

- (a) What are micelles? Explain the mechanism of cleansing action of soaps.
- (b) Will micelle formation take place in other solvent such as ethanol, explain.
- (c) Explain the formation of scum when hard water is treated with soap.
- (d) What change will you observe if you test soap with red and blue litmus paper?

Q35. (a) Draw a well labelled diagram of germination of pollen on stigma.  
(b) What is the fate of ovary and ovule after fertilisation?

(c) Which part of the flower produce the male gamete?

**OR**

(a) Draw a well-labelled diagram of female reproductive system

(b) Write the name of the part of reproductive system where two oviducts unite?

(c) Which structure remove the waste product generated from the embryo **Q36.** (a) Write any two rules for drawing ray diagram for image formation from lens, support the rules with ray diagrams.

- (b) Draw ray diagram for image formation when
  - i. Object is placed between  $F$  and  $O$  of a convex lens.
  - ii. Object is placed beyond  $2F_1$  of a convex lens.
- (c) Define SI unit of power of lens.

**OR**

- (a) What is Snell's law.
- (b) Define absolute refractive index, give an example.
- (c) Show the path of line passing through a rectangular glass slab with a neat labelled diagram.
- (d) Define lateral displacement.

### **SECTION E**

Q37. Read the passage given below and answer the following questions:

Fermentation is a process by which organic compounds dissociate into simpler molecules in the presence of microorganisms. During the fermentation of glucose, ethyl alcohol is produced. When large quantities of ethanol are consumed it tends to slow metabolic processes and tends to depress the central nervous system this results in lack of coordination, mental confusion, drowsiness, lowering of normal inhibition and finally stupor. The individual may feel relaxed without realizing that his sense of judgement, sense of timing and muscular coordination have been seriously impaired

(a) What is the molecular formula and IUPAC name of alcohol?

(b) What is denatured alcohol?

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(c) Briefly describe the harmful effects of drinking excess alcohol on human body.

(d) Explain fermentation process involved in the preparation of ethanol.

**OR**

(d) Write two uses of alcohol.



Q38. Read the paragraph and answer the following questions:  
In order to trace the inheritance of traits, Mendel crossed pea plants having one contrasting character or a pair of contrasting characters. When he crossed pea plants having round and yellow seeds with pea plants having wrinkled and green seeds, he observed that no plants with wrinkled and green seeds were obtained in the F1 generation. When the F1 generation pea plants were cross-bred by self-pollination, the F2 generation had seeds with different combinations of shape and colour also.

- (a) Write any two pairs of contrasting characteristics of pea plant used by Mendel other than those mentioned above.
- (b) Differentiate between dominant and recessive traits.
- (c) State the ratio of the combinations observed in F2 generation. What do you interpret from this result?

OR

Given below is a cross between a pure violet flowered pea plant (V) and a pure white flowered pea plant (v). Diagrammatically explain what type of progeny is obtained in F1 generation and F2 generation:

Pure violet flowered plant × Pure white flowered plant.

(VV)

(vv)

Q39. Read the paragraph and answer the following questions:

Seema went to a marriage in her family. She was amazed to see the decoration in the hall where fairy lights were used. But she saw in one of the corners, an electrician was testing bulbs to find which one has fused. Her mother explained the reason that why the bulbs were not glowing when one bulb got fused.

- (a) Explain why the bulbs were not glowing.
- (b) Explain why domestic wiring are parallel.
- (c) Two resistors with resistances 3 Ohms and 5 Ohms are to be connected to a battery of 4.5 V so as to obtain
- (i) Minimum current                      (ii) maximum current.
- How do you connect these resistors in each case?

OR

(c) In an electric circuit two resistors 2 Ohm and 4 Ohm respectively are connected in series to a 6 V battery. Find the heat dissipated by the 4 Ohm resistor in 5s?

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