

**Science**

Board Exam 2023

Sample Paper No. 2

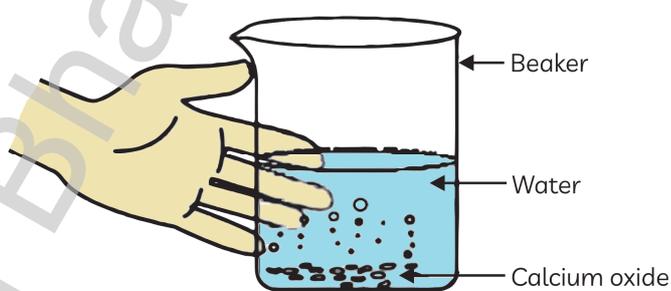
Class 10<sup>th</sup>

Time: 3 h

Marks: 80

Section	A	B	C	D	E
Q. No.	1 – 20	21 – 26	27 – 33	34 – 36	37 – 39
Marks	1	2	3	5	4
Type	MCQ	V. S. A. Type	S. A. Type	L. A. Type	Case Study Based

**Section A**

- Solutions A, B, C and D have pH 3, 4, 6 and 8. The solution with highest acidic strength is  
(a) A (b) B (c) C (d) D
  - Identify the type of reaction in the following experiment:  
(I) Combination Reaction  
(II) Decomposition Reaction  
(III) Exothermic Reaction  
(IV) Endothermic Reaction  
(a) Only (I) (b) Only (II)  
(c) Both (I) and (III) (d) Both (II) and (IV)
- 

Labels: Beaker, Water, Calcium oxide
- Rani took 5 ml of Lead Nitrate solution in a beaker and added approximately 4 ml of Potassium Iodide solution to it. What would she observe?  
(a) The solution turned red. (b) Yellow precipitate was formed.  
(c) White precipitate was formed. (d) The reaction mixture became hot.
  - Wasp stings can be treated with:  
(a) baking soda (b) vinegar (c) washing soda (d) milk of magnesia
  - An element E reacts with water to form a solution which turns phenolphthalein solution pink. The element E is most likely to be:  
(a) S (b) Ca (c) C (d) Ag
  - The table below gives the pH values of some substances in two columns.

Substance	pH value
(I) Brine	(a) 10
(II) Gastric Juices	(b) 7
(III) Milk of Magnesia	(c) 13
(IV) Aqueous sodium Hydroxide	(d) 1

The correct matching of substances and their pH value is:

- (a) I – (c); II – (b); III – (a); IV – (d) (b) I – (b); II – (a); III – (c); IV – (d)  
(c) I – (d); II – (b); III – (a); IV – (c) (d) I – (b); II – (d); III – (a); IV – (c)
- Which of the following is not a saturated hydrocarbon?  
(a) Cyclohexane (b) Benzene (c) Butane (d) Isobutane
  - The correct order of steps occurring in nutrition in animals is:

- (a) Ingestion → Absorption → Digestion → Assimilation → Egestion  
 (b) Ingestion → Digestion → Assimilation → Absorption → Egestion  
 (c) Ingestion → Digestion → Absorption → Assimilation → Egestion  
 (d) Ingestion → Assimilation → Digestion → Absorption → Egestion

9. Blood is pumped from the heart to the entire body by the:

- (a) lungs (b) ventricles (c) atria (d) nerves

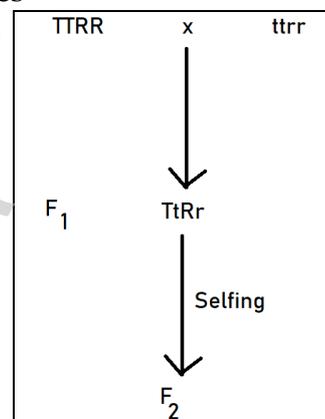
10. Observe the cross shown where long plant with round seeds (TTRR) crossed with short plants with wrinkled seeds (ttrr):

Which one of the following are new combinations?

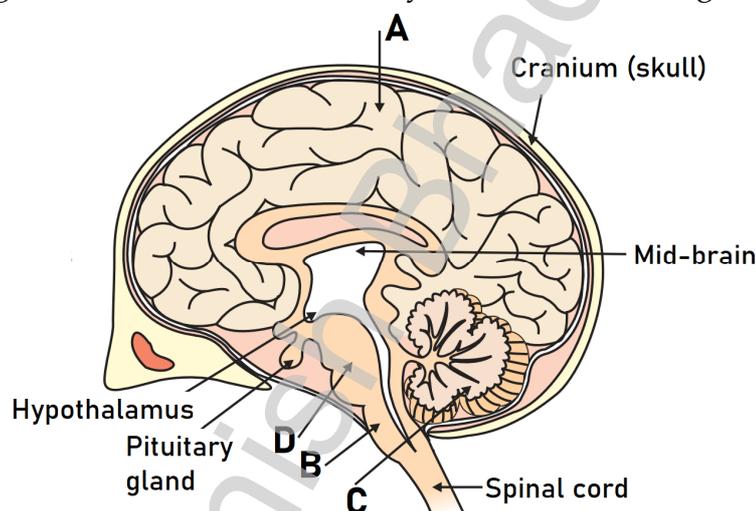
- (I) Tall with wrinkled seeds (II) Tall with round seeds  
 (III) Short with wrinkled seeds (IV) Short with round seeds.

Select the correct option:

- (a) (I) and (III) (b) (I) and (IV)  
 (c) (II) and (III) (d) (II) and (IV)



11. In the following diagram of human brain, identify the correct labelling:



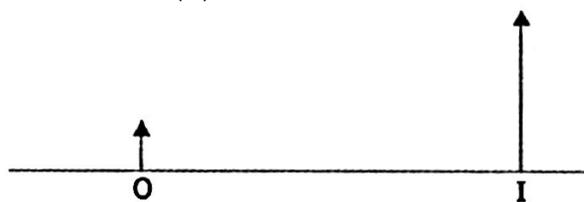
- (a) A – Pons, B – Medulla (b) B – Medulla, C – Cerebrum  
 (c) A – Cerebrum, C – Cerebellum (d) B – Cerebellum, D – Pons

12. Identify the organism exhibits the property of regeneration.

- (a) Aschelminthes (b) Tapeworms (c) Flukes (d) Planaria

13. The figure shows the positions of object O and its magnified image I. This is possible only if

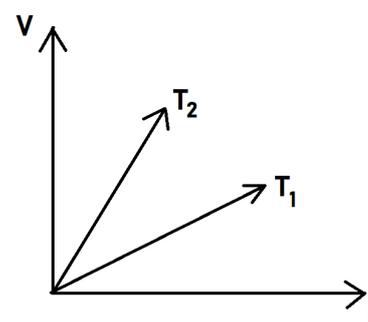
- (a) a concave mirror is placed to the right of I  
 (b) a concave mirror is placed between O and I  
 (c) a convex mirror is placed between O and I  
 (d) a convex mirror is placed to the right of I.



14. The voltage-current (V-I) graph of a metallic conductor at two different temperatures T<sub>1</sub> and T<sub>2</sub> is shown:

At which temperature is the resistance higher?

- (a) T<sub>1</sub>  
 (b) T<sub>2</sub>  
 (c) Equal at both T<sub>1</sub> and T<sub>2</sub>  
 (d) cannot say



15. Which of the following statements is correct regarding the propagation of light of different colours of white light in air?
- (a) Red light moves fastest
  - (b) Blue light moves faster than green light
  - (c) All the colours of the white light move with the same speed
  - (d) Yellow light moves with the mean speed as that of the red and the violet light
16. How the strength of an electromagnet can be increased?
- (a) By increasing the number of turns of solenoid
  - (b) By increasing the magnitude of current
  - (c) By using non-magnetic substance as core
  - (d) Both (a) and (b)

**DIRECTIONS:** In the questions numbered 17 to 20, a statement of **assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option.

- (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.
17. **Assertion (A):** When cupric oxide is heated in the presence of hydrogen gas, pure copper metal is obtained.  
**Reason (R):** Hydrogen acts as a reducing agent.
18. **Assertion (A):** Inheritance from the previous generation provides subtle changes in body design for the next generation.  
**Reason (R):** Greater diversity will be generated if asexual reproduction is involved.
19. **Assertion (A):** The centre of curvature is not a part of the mirror and it lies outside the reflecting surface of mirror.  
**Reason (R):** The reflecting surface of a spherical mirror is not a part of a sphere having a centre.
20. **Assertion (A):** A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when it is shifted away from the wire.  
**Reason (R):** Strength of a magnetic field decreases as one moves away from a current carrying conductor.

### Section B

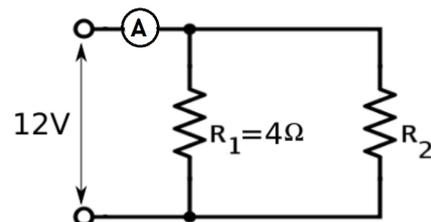
21. The atomic number of an element 'X' is 11.  
(i) Write the electronic configurations of X and find its valency.  
(ii) Write the formula and nature of its oxide.
22. State the role of the brain in reflex action.
23. How are fats digested in our bodies? Where does this process take place?
24. In birds and mammals the left and right side of the heart are separated. Give reasons.
25. State two positions in which a concave mirror produces a magnified image of a given object. List two differences between the two images.
26. The following organisms form a food chain: Insect, Hawk, Grass, Snake, Frog.  
Which of these will have highest concentration of non-biodegradable chemicals? Name the phenomenon.

## Section C

27. (a) What are redox reactions?  
 (b) Why is the reaction between manganese dioxide and hydrochloric acid a redox reaction?  
 (c) Identify the substance oxidized and the substance reduced in the above reaction.
28. What is Baking soda chemically called? Give reaction involved in its preparation. Write one of its uses.
29. Draw a neat diagram of Respiratory System in Humans and label the following:  
 (i) Trachea, (ii) Bronchi, (iii) Lungs, (iv) Larynx.  
 Where does exchange of gases take place?
30. (a) Two thin lenses of power +3.5 D and -2.5 D are placed in contact with each other. Find the power and focal length of the lens combination. (1 mark)  
 (b) A convex mirror used as a rear-view mirror in a car has a radius of curvature of 3 m. If an approaching bus is located at a distance of 5 m from this mirror, how far its image appears in the mirror? What is the nature of the image? (2 marks)
31. A person cannot see object farther than 12 m from the eye clearly. Name the defect of vision he is suffering from and the lens that should be used for correction of this defect. Illustrate with the help of a diagrams, how this lens will correct the defective vision.
32. What are the biotic components of an ecosystem? Explain main function of each.
33. (a) What is ozone? How does it protect the organisms on the Earth?  
 (b) State the main role of decomposers in the ecosystem. Name any two decomposers.

## Section D

34. An organic compound 'A' is widely used as preservative in pickles and has a molecular formula of  $C_2H_4O_2$ . This compound reacts with ethanol to form a sweet smelling compound 'B'.  
 (i) Identify the compound 'A'.  
 (ii) Write the chemical equation for its reaction with ethanol to form compound B.  
 (iii) How can we get compound 'A' back from compound 'B'?  
 (iv) Name the process and write the corresponding chemical equation.  
 (v) Write the structure and electron-dot of compound 'A'
35. (a) Draw a neat diagram of female reproductive system and label on it the following parts.  
 (i) Oviduct, (ii) Cervix, (iii) Vagina, (iv) Uterus.  
 (b) State any two functions of human ovary.
36. (a) On what factors the resistance of a metallic cylindrical conductor depends? how? (2 marks)  
 (b) How will resistance of a conductor change if it is stretched to double its length? (2 marks)  
 (c) In the given figure, find the value of resistor  $R_2$  for which the ammeter reads 9 A. (1 mark)

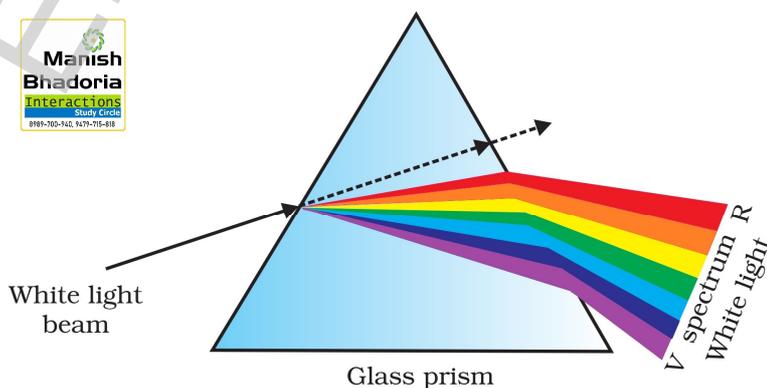


## Section E

37. Copper is a reddish, extremely ductile metal which is an unusually good conductor of electricity and heat. It is low in reactivity and therefore found in the free metallic state in nature. This native copper was first used more than 10,000 years ago by Neolithic (New Stone Age) humans. Earliest metallurgical processes to extract copper from its ore were first developed in Mesopotamia (present day Iraq) some 6000 years ago. They reduced copper to metal from ores with fire and charcoal, and intentionally alloyed it with tin as to make bronze (c. 3500 BCE). Today copper is used extensively in many industrial and domestic areas.



- (a) How is copper obtained from its sulphide ore? Explain in detail all chemical processes involved backed with balanced chemical equations.
- (b) Explain the electrolytic refining of impure copper with labeled diagram.
38. In a mono hybrid cross, pink coloured flowers are dominant over white coloured flowers. Parent plants belong to pure breeding dominant trait and pure breeding recessive trait. What will be the phenotype or morphological feature of  $F_1$  generation? If  $F_1$  plants are self fertilized, what would be the phenotypic ratio, or how many dominant and recessive traits will be produced in the progeny? Explain with an illustration,
39. When a beam of white light passes through a glass prism, different colours refract through different angles causing a splitting of white light into its seven constituent colours (VIBGYOR). This gives rise to the formation of the colour spectrum.



When a second identical prism is placed in an inverted position with respect to first prism, a beam of white light emerges from the other side of the second prism. The second prism recombines all the seven colours to give a beam of white light.

(a) Name the phenomenon. State the cause of this. (1 mark)

(b) Which colour light has the highest frequency and which has the lowest? (1 mark)

(c) Draw a ray diagram to show the path of a narrow beam of white light, through a combination of two identical prisms arranged together in inverted position with respect to each other, when it is allowed to fall obliquely on one of the faces of the first prism of the combination. (2 marks)



### Words of Wisdom

It is our choices that show what we truly are, far more than our abilities.

- J.K. Rowling

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