

Science

Board Exam 2023

Sample Test Paper No. 1

Class 10th

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

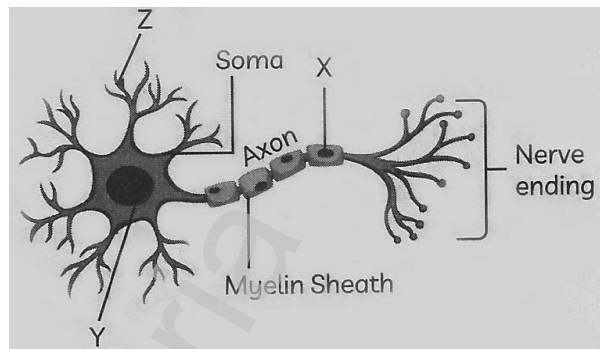
- A few drops of aqueous NaOH are dropped on a pH paper. The colour of the pH paper will turn to:
 - blue
 - green
 - yellow
 - violet
- Which of the following are combination reactions?
 - $2 \text{KClO}_3 \xrightarrow{\text{Heat}} 2 \text{KCl} + 3 \text{O}_2$
 - $\text{MgO} + \text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2$
 - $4 \text{Al} + 3 \text{O}_2 \rightarrow 2 \text{Al}_2\text{O}_3$
 - $\text{Zn} + \text{FeSO}_4 \rightarrow \text{ZnSO}_4 + \text{Fe}$
 - (i) and (iii)
 - (iii) and (iv)
 - (ii) and (iv)
 - (ii) and (iii)
- In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?
 - Lead sulphate (insoluble)
 - Lead acetate
 - Ammonium nitrate
 - Potassium sulphate
- Farmers neutralise the effect of acidity of the soil by adding
 - slaked lime
 - gypsum
 - caustic soda
 - baking soda
- An element X reacts with hydrogen, when heated, to form a covalent hydride H_2X . If H_2X has a smell of rotten eggs, the element X is likely to be:
 - carbon
 - sulphur
 - chlorine
 - phosphorus
- The elements whose oxides can turn phenolphthalein solution pink are:
 - Na and K
 - K and C
 - Na and S
 - K and P
- Butanone is a four-carbon compound with the functional group
 - Carboxylic acid
 - aldehyde
 - ketone
 - alcohol
- Which of the following has the longest small intestine?
 - carnivore
 - omnivore
 - herbivore
 - autotroph
- Human males have 23 pairs of chromosomes in their cells and females also have 23 pairs of chromosomes. But when these combine or after fusion, why don't an offspring have 46 pairs of chromosomes?
 - Mitosis occurs during gamete formation which halves the chromosome.
 - Mitosis occurs in zygote which reduces chromosome number.
 - Mitosis occurs during gamete formation.
 - Mitosis in zygote reduces chromosome number.

10. Which of the following is the correct sequence of air passage during inhalation?

- (a) nostrils → larynx → pharynx → trachea → lungs
 (b) nasal passage → trachea → pharynx → larynx → alveoli
 (c) larynx → nostrils → pharynx → lungs
 (d) nostrils → pharynx → larynx → trachea → alveoli

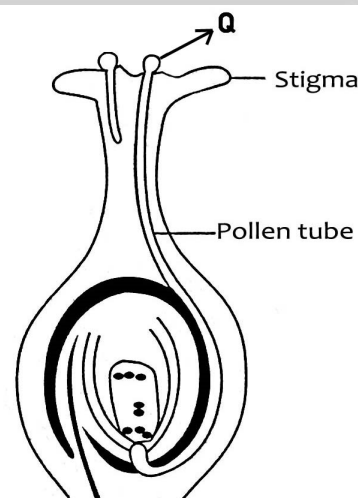
11. Identify the structures X, Y and Z in the figure.

	X	Y	Z
(a)	Schwann cell	Dendrite	Nucleus
(b)	Dendrite	Schwann cell	Nucleus
(c)	Nucleus	Dendrite	Schwann cell
(d)	Schwann cell	Nucleus	Dendrite



12. Examine the illustration of the pollen-pistil interaction. The name and number of the structure produced by Part 'Q':

- (a) Male gamete, two
 (b) Female gamete, one
 (c) Male gamete, one
 (d) Female gamete, two



13. The amount of charge passed through any area of cross section of a conductor when a current of 20 A flows through it for three minutes is:

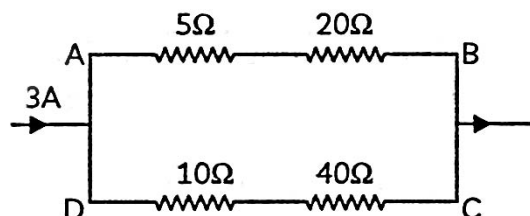
- (a) 36 C (b) 3600 C (c) 1800 C (d) 180 C

14. Which of the following statements about magnetic lines of magnetic field is incorrect?

- (a) The north pole of a magnetic compass is assumed to point in the direction of the magnetic field at a point.
 (b) Magnetic field lines are curled, closed lines.
 (c) Zero field strength is represented by parallel and evenly spaced magnetic field lines.
 (d) The degree of closeness of the field lines indicates the relative strength of the magnetic field.

15. In the figure shown here, the current flowing through the 40 Ω resistor is:

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



16. In a house, the MCB keeps on tripping again and again. What could be the reason of this phenomenon?

- (a) Overloading (b) Short circuit (c) Faulty design (d) All of these

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 reason **R** is false.
- (d) **A** is false but reason **R** is true.

17. **Assertion (A):** Carbon forms strong bonds with other elements making these these compounds exceptionally stable.
Reason (R): The formation of strong bonds by carbon is due to its small size.
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):** A Tiger has a shorter small intestine whereas a deer has a longer small intestine.
Reason (R): The length of the small intestine depends on the type of food the animal eats.
20. **Assertion (A):** When a white light beam passes through a glass prism, it emits a spectrum.
Reason (R): The speed of light inside a glass prism differs from the speed of light outside.

Section B

21. What is thermit reaction? How is it used to join railway tracks or cracked machine parts?
22. Different parts of brain are associated with specific functions. Name the part of human brain which performs the following functions:
(a) Sensation of feeling full (b) Vomiting
(c) Picking up a pencil (d) Riding a bicycle
23. (a) Draw a schematic representation of transport and exchange of oxygen and CO₂ in human body.
(b) What is meant by double circulation?
24. Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement.
25. Why does it take some time to see the objects in dim room when we enter the room from bright sunlight outside?
26. What are biotic and abiotic factors of an ecosystem? Give some examples.

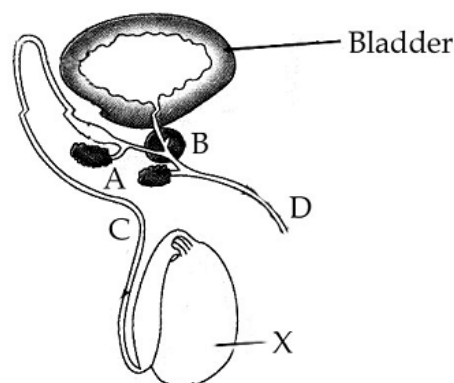
Section C

27. In the electrolysis of water,
a) Name the gas collected at anode and cathode.
b) Why is the volume of gas collected at one electrode double than the other?
c) What would happen if dil. H₂SO₄ is not added to water?
28. A compound which is prepared from gypsum has the property of hardening when mixed with a proper quantity of water. Identify the compound and write its chemical formula. Write the chemical equation for its preparation. Mention any one use of the compound.
29. Explain the ways in which glucose is broken down in absence of oxygen.

30. Rohit focused the image of a candle flame on a white screen using a convex lens. He noted down the position of the candle, screen and lens as under :
- Position of candle = 26.0 cm
 Position of convex lens = 50.0 cm
 Position of screen = 74.0 cm
- What is the focal length of the convex lens?
 - Where will the image be formed if he shifts the candle towards the lens at a position of 38 cm?
 - Draw a ray diagram to show the formation of the image in case (ii) as said above?
31. (a) A person is suffering from both myopia and hypermetropia.
- What kind of lenses can correct this defect?
 - How are these lenses prepared?
- (b) A person needs a lens of power + 3D for correcting his near vision and -3D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.
32. (a) What is an electromagnet? List any two uses.
- (b) Draw a labelled diagram to show an electromagnet is made.
- (c) State the purpose of soft iron core used in making an electromagnet.
33. (a) Why are green plants called producers?
- (b) In the following food chain 5 J of energy is available to man. How much energy was available at producer level?
 Plants → sheep → man
- (c) In a food chain consisting of snake, insect, grass and frog, assign an appropriate trophic level to frog.

Section D

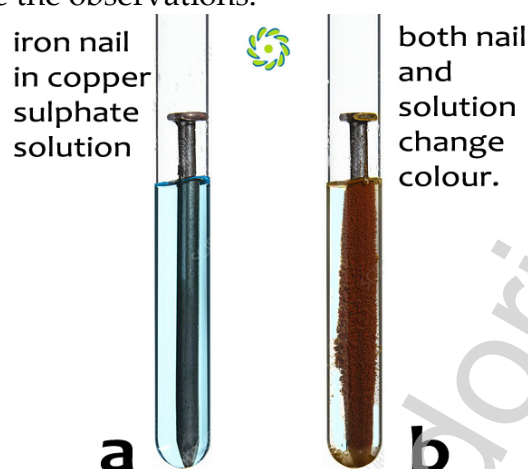
34. Draw the structural formulae of all the possible isomers of the compound with the molecular formula C_3H_6O and also give their electron dot structures.
35. In the diagram of human male reproductive system given here:
- Label parts A and B.
 - Name the hormone produced by organ 'X'. What is the role of this hormone in the human male?
 - Mention the name of substances that are transported by tubes: (i) C, (ii) D.



36. With the help of a labelled circuit diagram describe an activity to illustrate the pattern of the magnetic field lines around a straight current carrying long conducting wire.
- Name the rule that is used to find the direction of magnetic field associated with a current carrying conductor.
 - Is there a similar magnetic field produced around a thin beam of moving
 - alpha particles and
 - neutrons? Justify your answer.

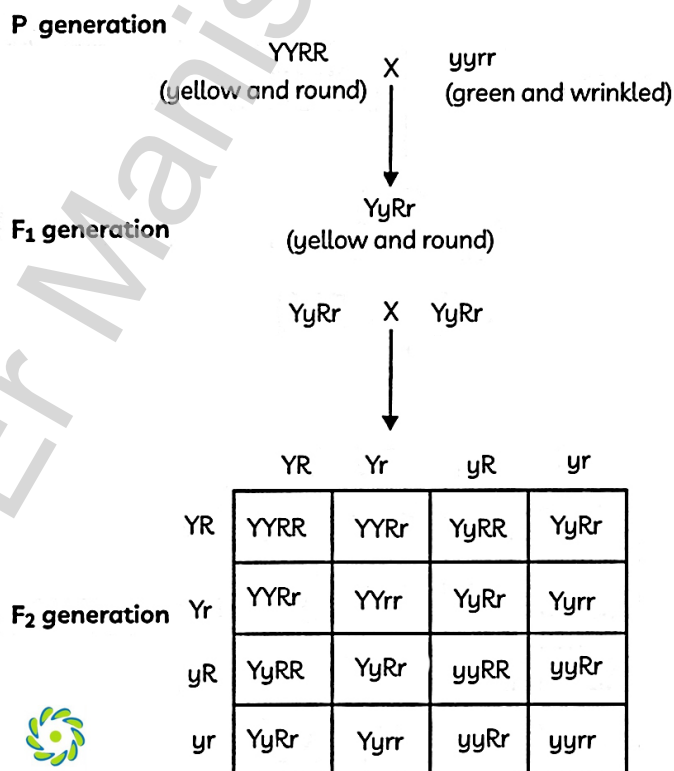
Section E

37. An experimental set-up was placed in the laboratory by the teacher for class X students as shown in figure (a) in which an iron nail was placed in the copper sulphate solution, to record the observations. After few hours, the students noticed the changes as shown in figure (b). The teacher guided them to write the observations.



Answer the following questions based on the observation:

- Students noticed the change in colour of the copper sulphate solution. What is the change and why it happened?
 - Which type of chemical reaction is taking place in the given figure and why?
 - If copper nails are placed in ferrous sulphate solution, will the same reaction take place?
38. The following chart explains the dihybrid cross in detail between one pea plant with yellow and round seeds and the other pea plant having green and wrinkled seeds. After studying the above cross, a student noted down the following observations regarding progeny of F_2 generation. Analyse it and answer the following questions:

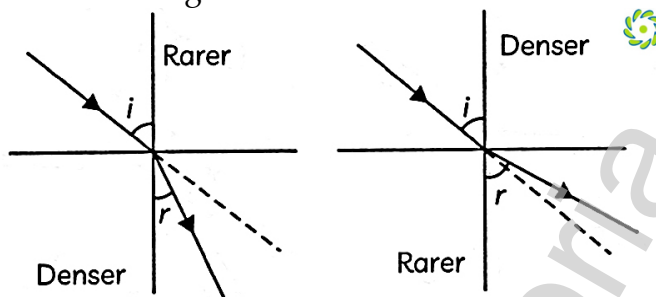


(i) What is the ratio obtained in F_2 generation?

(ii) In the F₂ generation of a cross, it was observed that the phenotypic ratio of progeny having different traits is 485 : 165 out of 650 observations. What type of cross is this? Explain.

(iii) A cross between the purple flowers of pea plant (PP) and white flowers (pp) resulted in all F₁ progeny that had purple flowers. Why?

39. The path of light is altered when it moves from one transparent medium to another. This phenomenon is known as light refraction. The optical density of the medium that the light passes through determines how the light will bend.



From medium to medium, light travels at varying speeds. A medium with a higher speed of light is optically rarer, whereas a medium with a lower speed of light is optically denser. When light travels from one medium to another, its frequency does not alter; instead, its speed and wavelength do. It came to the conclusion that the primary cause of refraction is a change in light speed.

(i) How do light rays bend in one of the above two ways when they pass from air through glass?

(ii) What happens to the frequency of light when light travels from air to glass?

(iii) At what angle the ray of light hits the boundary of second medium so that no bending of light occurs?



Words of Wisdom

Challenges are what make life interesting and overcoming them is what makes life meaningful.

- Joshua J. Marine

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