Sample Paper 29

Class X 2026-27

Science (086)

Time: 3 Hours **Max. Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
2. All questions are compulsory. However, an internal choice is provided in some-questions. A student is expected to attempt only one of these questions.

SECTION-A

1. The energy released during cellular respiration is captured to form a molecule that acts as the energy currency for the cell. What is this molecule?

(a) ATP (Adenosine Triphosphate)
(b) DNA (Deoxyribonucleic Acid)
(c) RNA (Ribonucleic Acid)
(d) ADP (Adenosine Diphosphate)

2. A deficiency of iodine in the diet can lead to a condition known as goitre, which is characterized by a swollen neck. This is caused by the enlargement of which gland?

(a) Pituitary gland
(b) Adrenal gland
(c) Pancreas
(d) Thyroid gland

3. What is the female reproductive part of a flower, which typically consists of the stigma, style, and ovary?

(a) Stamen
(b) Pistil
(c) Petal
(d) Sepal

4. What are fossils?

(a) The oldest living species found on Earth.
(b) The preserved remains or traces of organisms that lived in the past.
(c) Rocks that have been shaped by ancient organisms.
(d) The study of the history of life on Earth.

5. Which of the following is an example of a man-made or artificial ecosystem?

(a) A forest
(b) A pond
(c) A desert
(d) An aquarium

6. Consider the following statements about the human excretory system:

(i) The main organs of excretion are the pair of kidneys.
(ii) The nephron is the basic filtration unit within the kidney.
(iii) The purpose of the system is to filter and remove nitrogenous wastes like urea from the blood.
(iv) All the fluid filtered into the nephron is excreted as urine without any reabsorption.

Which of the above statements are correct?

(a) (i) and (iv) only
(b) (ii) and (iii) only
(c) (i), (ii), and (iii)
(d) All are correct.

7. Which part of the human brain is considered the main thinking part and is responsible for functions like intelligence, memory, and voluntary actions?

(a) Cerebrum (b) Cerebellum
(c) Medulla (d) Hypothalamus

8. **Assertion (A) :** In human males, the testes are located in the scrotum, outside the abdominal cavity.
Reason (R) : The scrotum maintains a temperature 1-3°C higher than the normal body temperature, which is required for sperm formation.

(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.

9. **Assertion (A) :** Decomposers are essential for the stability and continuity of an ecosystem.
Reason (R) : They break down dead organic matter into simple inorganic nutrients that can be reused by producers.

(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.

10. Plants produce waste products during their life processes. Explain two ways in which plants get rid of their excretory products.

11. Attempt either option A and B.

A. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

OR

B. What is transpiration, and how does it help in the upward movement of water in plants?

12. What is a food chain? In a terrestrial ecosystem containing grass, insects, birds, and snakes, construct a four-level food chain.

13. What is a synapse? Explain how a nerve impulse is transmitted from one neuron to the next across this gap.

14. In pea plants, tallness (T) is dominant over dwarfness (t), and violet flowers (V) are dominant over white flowers (v). If a homozygous tall, violet-flowered plant (TTVV) is crossed with a homozygous dwarf, white-flowered plant (ttvv):

(i) What will be the genotype of the F1 generation?
(ii) If F1 plants are self-pollinated, what phenotypic ratio is expected in the F2 generation?

15. A person has a meal containing chapati (starch) and paneer (protein and fat).

A. In which part of the alimentary canal does the digestion of starch begin? Name the enzyme involved.

OR

B. Where does the digestion of protein start? Name the enzyme and the condition required for its action.
C. Which organ secretes a juice that helps in emulsifying fats?

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16. Attempt either option A and B

A. A gardener wants to grow multiple rose plants that are identical to a parent plant with desirable flowers.
   (i) Which method of reproduction should he opt for? Justify your choice.
   (ii) State two advantages of this method.

OR

B. A student observes a flower in a garden.
   (i) What are the male and female reproductive parts of a flower called?
   (ii) What happens to the ovule and ovary after fertilization?
   (iii) What is the function of the petals?

SECTION-B

17. The reaction $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$ is an example of a:
(a) Combination reaction
(b) Double displacement reaction
(c) Decomposition reaction
(d) Displacement reaction

18. A bee sting injects an acidic liquid into the skin, causing pain and irritation. Which of the following household items would provide relief if applied to the affected area?
(a) Lemon juice
(b) Vinegar
(c) Baking soda solution
(d) Orange juice

19. Which of the following pairs of reactants will result in a displacement reaction?
(a) NaCl solution and Copper metal
(b) $MgCl_2$ solution and Aluminium metal
(c) $FeSO_4$ solution and Silver metal
(d) $AgNO_3$ solution and Copper metal

20. In which of the following compounds is the functional group –OH present?
(a) Butanone
(b) Butanal
(c) Butanoic acid
(d) Butanol

21. Gypsum is heated carefully at 373 K to form another compound 'X' which is used as a plaster for supporting fractured bones. The chemical formula of 'X' is:
(a) $CaSO_4$
(b) $CaSO_4 \cdot H_2O$
(c) $CaSO_4 \cdot 2H_2O$
(d) $CaSO_4 \cdot \frac{1}{2}H_2O$

22. Bauxite, with the formula $Al_2O_3 \cdot 2H_2O$, is the primary ore of which metal?
(a) Iron
(b) Aluminium
(c) Copper
(d) Zinc

23. Which of the following processes is endothermic in nature?
(a) Respiration
(b) Decomposition of vegetable matter into compost
(c) Decomposition of calcium carbonate
(d) Burning of a candle

24. **Assertion (A) :** Ethane is a saturated hydrocarbon.
Reason (R) : A saturated hydrocarbon contains only carbon-carbon and carbon-hydrogen single bonds.
(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.

25. What is a balanced chemical equation? Why should chemical equations always be balanced?

26. Attempt either option A or B.
A. Give a scientific reason for the following statements:
(i) Ionic compounds are generally soluble in water.
(ii) Aluminium is a reactive metal, yet it is widely used for making cooking utensils.
(iii) Copper does not displace hydrogen from dilute acids.

OR

B. Draw a neat and well-labelled diagram showing the electrolytic refining of copper.

27. What are isomers? Draw the three possible structural isomers of pentane (C_5H_{12}).

28. The electrolysis of a concentrated aqueous solution of common salt (brine) is an important industrial process.
(a) What is the common name for this industrial process?
(b) Name the three main products formed during this process.

OR

(c) One of the products is a gas used for disinfecting drinking water. Name this gas and state at which electrode (anode or cathode) it is produced.
(d) Another product obtained is a gas that burns with a 'pop' sound. Name this gas and give one of its important industrial uses.

29. Attempt either option A or B.
A. (a) Draw the electron-dot structure for a molecule of ethanoic acid (CH_3COOH).
(b) How does ethanoic acid react with sodium hydroxide? Write the balanced chemical equation for the reaction.
(c) What is the common name of ethanoic acid?

OR

B. (a) Define a homologous series.
(b) Give the name and draw the structure of the second member of the alkene homologous series.
(c) Write the molecular formula of the fourth member of the alkyne homologous series.

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SECTION-C

30. A student is learning about the use of different lenses and makes the following statements:

I. A convex lens is used to correct myopia.

II. A concave lens is used to correct hypermetropia.

III. A convex lens is used as a magnifying glass.

Choose from the following the correct option that lists the correct statements.

(a) I and II (b) I and III

(c) I, II and III (d) III only

31. A student is asked to find the focal length of a convex lens using a screen. Which of the following conditions is required for this experiment?

(a) The object should be placed at the focal point.

(b) A real and inverted image should be formed on the screen.

(c) The object should be placed between the focus and optical center.

(d) A virtual and erect image should be formed on the screen.

32. **Assertion (A) :** When an object is placed at the center of curvature of a concave mirror, the image is real, inverted, and of the same size.

Reason (R) : All rays passing through the center of curvature retrace their path after reflection.

(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.

33. An object is placed beyond 2F of a convex lens.

A. Where will image form?

B. State size and nature.

C. Draw ray diagram.

34. Attempt either option A or B.

A. You have following material:

An ammeter (0-1 A), a voltmeter (0-3 V), a resistor of $20\,\Omega$, a key, a rheostat, a battery of 3 V and seven connecting wires.

Using this material draw a labelled circuit diagram to study the dependence of potential difference (V) across a resistor on the current (I) passing through it.

OR

B. Give reasons for the following :

(i) What do you understand by the term fuse in an electric circuit ?

(ii) Fuse wire is placed in series with the device.

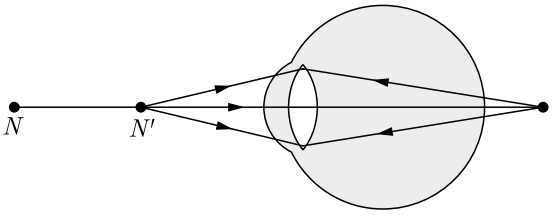
35. (a) Ravi kept a book at a distance of 10 cm from the eyes of his friend Hari. Hari is not able to read anything written on the book. Explain why ?

(b) A lens of focal length 5.0 cm is being used by a student in the laboratory as a magnifying glass. His least distance of distinct vision is 25 cm. What magnification is the student getting ?

36. State the factors on which the resistance of a cylindrical conductor depends. How will resistance of a conductor change if it is stretched so that its length is doubled ?

37. Demonstrate that due to motion of a magnet near a solenoid coil an induced current is set up in the coil.

38. A person is suffering from hypermetropia (long sightedness). It is a defect in which a human eye can see far off object clearly, but is unable to see nearby object distinctly. The near point of the person is 1.5 m. Assume that the near point of the normal eye is 25 cm.



(i) What type of lens should be used in his spectacles?
(ii) What should be the focal length of the lens he used ?
(iii) What will be the power of the lens ?

OR

(iv) Write one possible cause of this defect.

39. Attempt either option A or B.

A. (i) Deduce the expression for the equivalent resistance of the parallel combination of three resistors R_1 , R_2 and R_3.
(ii) Consider the following electric circuit.
(a) Which two resistors are connected in series?
(b) Which two resistors are connected in parallel?
(c) If every resistors of the circuit is of 2 Q, what current will flow in the circuit?.

OR

B. What is meant by magnetic force ? Name and explain the rule to determine the direction of force experienced by a current carrying conductor in a magnetic field. How does this force gets affected on :
(i) doubling the magnitude of current.
(ii) reversing the direction of current flow and
(iii) reversing the direction of magnetic field?

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