Sample Paper 19

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. What is the term for the wave-like muscular contractions that move food along the length of the alimentary canal?

(a) Translocation
(b) Absorption
(c) Peristalsis
(d) Egestion

2. The human brain is a very delicate organ that requires protection. It is enclosed within a bony box known as the:

(a) Cranium
(b) Vertebral column
(c) Rib cage
(d) Sternum

3. Which of the following organisms typically reproduces asexually through the formation of spores?

(a) Amoeba
(b) Hydra
(c) Planaria
(d) Rhizopus (Bread mould)

4. Which of Mendel's laws states that when two different alleles for a trait are present in an individual, only one allele is expressed in the phenotype?

(a) Law of Segregation
(b) Law of Dominance
(c) Law of Independent Assortment
(d) Law of Unit Inheritance

5. Ozone (O_3) is continuously formed and broken down in the stratosphere. How is ozone formed?

(a) By the reaction of oxygen with carbon monoxide.
(b) By the action of high-energy UV radiation on oxygen (O_2) molecules.
(c) By the combination of nitrogen and oxygen during lightning.
(d) By the emission of gases from volcanoes.

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

(i) Double circulation involves two circuits: the pulmonary circuit and the systemic circuit.
(ii) The pulmonary circuit transports blood between the heart and the lungs.
(iii) The systemic circuit transports blood between the heart and the rest of the body.
(iv) A major advantage of this system is the mixing of oxygenated and deoxygenated blood.

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 of the following plant hormones is known for promoting stem elongation, breaking the dormancy of seeds, and stimulating the development of fruit?

(a) Auxin
(b) Gibberellin
(c) Cytokinin
(d) Abscisic acid

8. **Assertion (A) :** Asexual reproduction leads to offspring with very little genetic variation.
Reason (R) : Asexual reproduction involves only a single parent and no fusion of gametes.

(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) :** Anaerobic respiration releases much less energy than aerobic respiration.
Reason (R) : In anaerobic respiration, the breakdown of glucose is incomplete.

(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. The leaves of most plants appear green. What is the reason for this colour, and what is the function of this green pigment?

11. Student to attempt either option A or B.

A. What is the final product of the digestion of fats? Where in the digestive tract does this process primarily occur?

OR

B. What is 'transpirational pull'? How does it aid in the transport of water in plants?

12. Draw a simple food chain that might exist in a pond ecosystem and label the different trophic levels.

13. What is meant by a feedback mechanism? Using the regulation of thyroxine as an example, explain how it works.

14. List any three of the seven contrasting traits of pea plants selected by Mendel for his experiments. For any one of the traits, specify which form was dominant and which was recessive.

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15. A meal is ingested and passes through the alimentary canal. Refer to the diagram of the human digestive system to the questions.

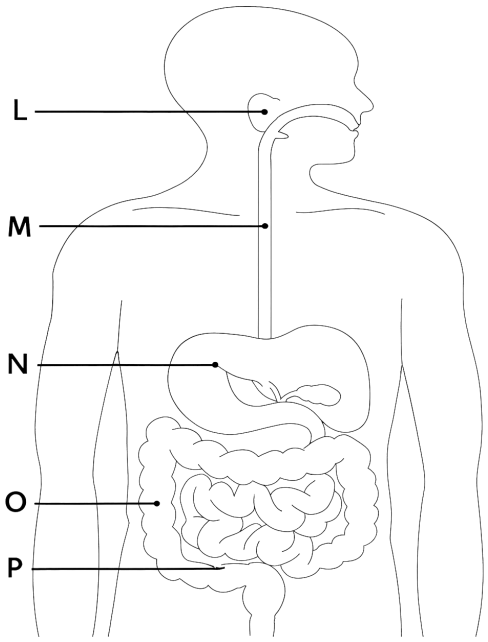


Figure: Human Alimentary canal

A. What is the function of the part labelled 'M' (Oesophagus)? Name the muscular movement responsible for pushing food through it.

OR

B. Describe the role of the part labelled 'N' (Stomach) in the process of digestion.

C. In which part of the alimentary canal (labelled O or P) is the process of digestion completed?

16. A. (i) What is meant by spore formation? Name an organism that reproduces by this method.
(ii) List two advantages of reproducing through spores.
(iii) How is this method different from fission?

OR

B. (i) What is the significance of the testes being located within the scrotum outside the abdominal cavity?
(ii) State the functions of the oviduct and the uterus in the female reproductive system.
(iii) Name one bacterial and one viral sexually transmitted disease (STD).

SECTION-B

17. In the reaction $H_2S + Cl_2 \rightarrow 2HCl + S$, which substance acts as the oxidizing agent?

(a) H_2S (b) Cl_2
(c) HCl (d) S

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18. Which of the following pH values represents the solution of the strongest acid?
(a) 7 (b) 5
(c) 2 (d) 11

19. Which of the following metals is reactive enough to react with cold water to produce hydrogen gas?
(a) Iron (b) Magnesium
(c) Calcium (d) Zinc

20. The first member of the homologous series of ketones has the IUPAC name:
(a) Methanone (b) Ethanone
(c) Propanone (d) Butanone

21. A person suffering from acidity is often given a solution of "Milk of Magnesia" for relief. This substance works because it is a:
(a) Strong acid (b) Mild base
(c) Strong base (d) Neutral salt

22. Food cans are typically made of steel coated with tin. They are not coated with zinc because:
(a) Zinc is more expensive than tin. (b) Zinc has a higher melting point than tin.
(c) Zinc is more reactive than tin. (d) Zinc is less reactive than tin.

23. During the electrolysis of water, a decomposition reaction takes place. The mole ratio of hydrogen gas (H_2) to oxygen gas (O_2) liberated is:
(a) 1:1 (b) 2:1
(c) 1:2 (d) 4:1

24. **Assertion (A) :** Diamond is extremely hard while graphite is a soft and slippery solid.
Reason (R) : Diamond has a rigid three-dimensional tetrahedral network structure, while graphite has a hexagonal layered structure where layers can slide over each other.
(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 are alloys? Name the metallic constituents of (i) Brass and (ii) Bronze.

26. Attempt either option A or B.
(a) Explain why saturated hydrocarbons generally burn with a clean, blue flame while unsaturated hydrocarbons typically burn with a yellow, sooty flame.

OR

(b) (i) What is a homologous series?
(ii) Write the molecular formula of the second and third members of the homologous series whose first member is methane (CH_4).

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27. A metal 'M' is dropped into a test tube containing dilute sulphuric acid. A gas 'G' is evolved which is collected and tested. It burns with a characteristic 'pop' sound.

(a) Identify the gas 'G'.

(b) Suggest a possible metal that 'M' could be.

(c) Write the balanced chemical equation for the reaction, using the metal you suggested in part (b).

28. A chemical compound 'X', prepared from sodium chloride, is used in the glass and paper industries and is also used to soften hard water.

(a) Identify the compound 'X' and write its chemical formula including its water of crystallisation.

(b) What is the nature of an aqueous solution of 'X' (acidic/basic)? What happens to 'X' when it is left exposed to open air?

(c) Write the balanced chemical equation showing the final step of its preparation (production from sodium bicarbonate).

OR

(c) List any two specific uses of compound 'X' apart from those mentioned above.

29. Attempt either option A or B.

(A) (a) What is an esterification reaction? Write the chemical equation for the reaction between ethanoic acid and ethanol.

(b) What is a saponification reaction? Write a chemical equation for this process.

(c) Name the two main products obtained from the saponification reaction.

OR

(B) (a) Define catenation.

(b) Explain why carbon is unique in its ability to exhibit catenation to a large extent.

(c) Draw the structures for the following organic compounds:

(i) Propanal

(ii) Butanone

(iii) Hexanoic acid

SECTION-C

30. A student makes the following statements about the properties of a convex lens:

I. It is thicker at the center than at the edges.

II. It is a converging lens.

III. It can form a real image.

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) II and III

31. A student is trying to find the focal length of a concave mirror. Which of the following methods would work?

(a) Placing a distant object and measuring the distance of the real image.

(b) Placing an object at the center of curvature and measuring the image distance.

(c) Using the mirror formula with a known object and image distance.

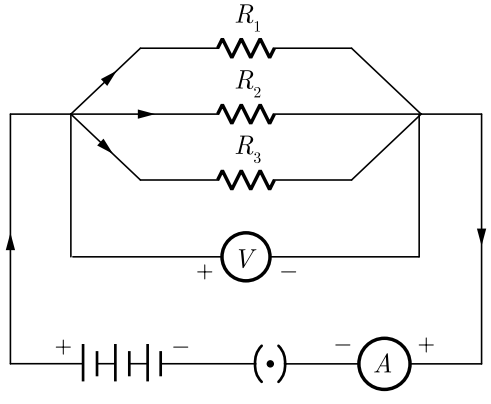
(d) All of the above methods.

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32. **Assertion (A) :** A ray of light passing through the center of curvature of a concave mirror is reflected back along the same path.
Reason (R) : The ray of light hits the mirror at a right angle to the surface, and thus the angle of incidence is zero.
(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. The radius of curvature of a spherical mirror is 32 cm.
A. Find its focal length.
B. Which formula is used here?
C. State whether it is concave or convex if it produces real images.

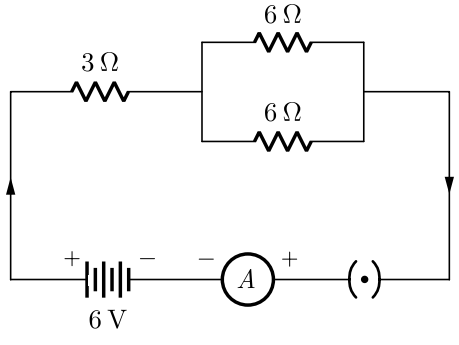
34. Attempt either option A or B
A. In the circuit given below, the resistors R_1, R_2 and R_3 have the values $10\,\Omega$, $20\,\Omega$ and $30\,\Omega$ respectively, which have been connected to a battery of 12 V.



Calculate
(a) the current through each resistor,
(b) the total circuit resistance, and

OR

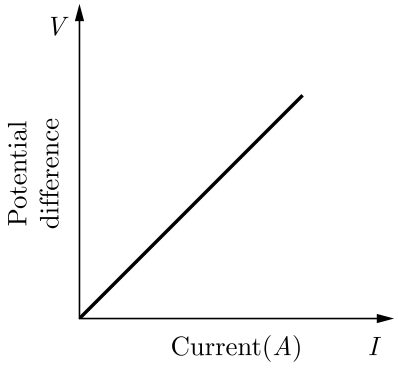
B. In the given circuit, find :



(a) Total resistance of the network of resistors
(b) Current through ammeter A, and

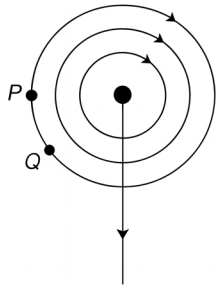
35. (a) State two main causes of developing far-sightedness.
(b) How can this defect of vision be corrected ?

36. V-I graph for a conductor is as shown in figure.



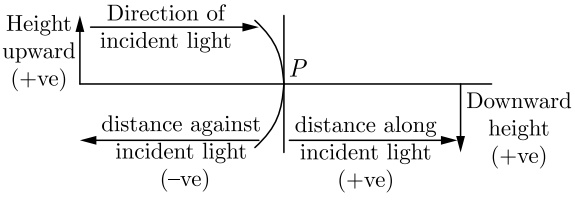
(i) What do you infer from this graph ?
(ii) State the law expressed here
(iii) Name the physical quantity represented by the slope of this graph and its unit.

37. The magnetic field lines are shown around a current-carrying straight conductor. A student claims that the magnetic field strength at point P is stronger than at point Q.



(i) Is the student's claim correct? Give reason.
(ii) Redraw the diagram and mark the direction of magnetic field lines using right-hand thumb rule.

38. While dealing with the reflection of light by spherical mirrors, we shall follow a set of sign conventions called the New Cartesian Sign Convention. In this convention, the pole (P) of the mirror is taken as the origin. The principal axis of the mirror is take as the x-axis of the coordinate system. In a spherical mirror, the distance of the object from its pole is called the object distance (u). The distance of the image from the pole of the mirror is called the image distance (v). Magnification produced by a spherical mirror gives the relative extent to which the image of an object is magnified with respect to the object size. It is expressed as the ratio of the height of the image to the height of the object. It is usually represented by the letter (m).



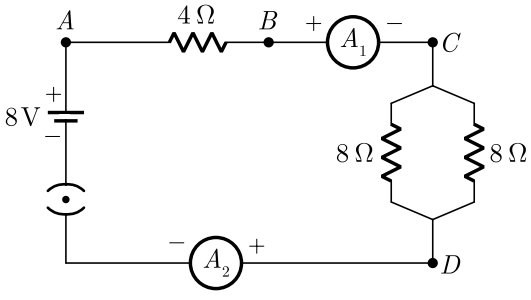
(i) How can you calculate the magnification of a spherical mirror ?
(ii) What does a negative sign in the value of magnification indicates?
(iii) Find the focal length of a convex mirror whose radius of curvature is 32 cm.

OR

(iv) Why does the height of the object is taken to be positive?

39. Attempt either option A or B.

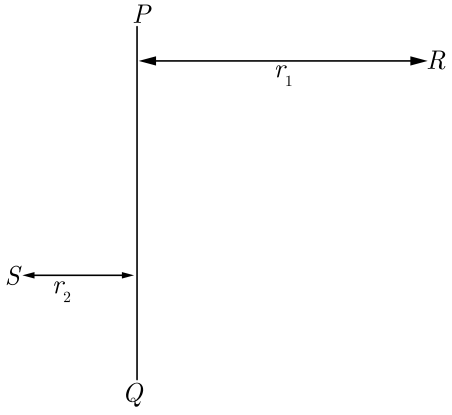
A. Find out the following in the electric circuit given in figure :



(i) Effective resistance of two 8 Ω resistors in the combination.
(ii) Current flowing through 4 Ω resistor.
(iii) Potential difference across 4 Ω resistance.
(iv) Power dissipated in 4 Ω resistor.
(v) Difference in ammeter readings, if any.

OR

B. PQ is a current carrying conductor in the plane of the paper as shown in the figure below.



(i) Find the directions of the magnetic fields produced by it at points R and S? Given $r_1 > r_2$, where will the strength of the magnetic field be larger? Give reasons.
(ii) Field strength at which point will be greater?
(iii) If the polarity of the battery connected to the wire is reversed, how would the direction of the magnetic field be changed?
(iv) Explain the rule that is used to find the direction of the magnetic field for a straight current carrying conductor.

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