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CLASS 9

Science

Sample Paper 3 - Questions

39 questions | 80 marks | 2026-27

Time: 3 hours. Answer all questions and subparts unless a choice is stated. Marks are shown on the right. Write answers on separate sheets. Independently prepared practice paper.

Section A - Objective questions

1. Identify the term described by this statement: A homogeneous mixture has solute particles distributed uniformly in a solvent. **1**

(A) Binomial nomenclature

(B) Mitochondrion

(C) Solution

(D) Asexual reproduction

2. Which statement correctly describes Xylem? **1**

(A) A scientific name combines a genus name and a specific epithet using standard conventions.

(B) Solute mass divided by total solution mass, multiplied by 100, expresses mass-by-mass concentration.

(C) A homogeneous mixture has solute particles distributed uniformly in a solvent.

(D) A plant tissue conducts water and dissolved minerals and also contributes mechanical support.

3. Which statement correctly describes Mitochondrion? **1**

(A) Load divided by effort measures a machine's force multiplication.

(B) Water moves across a selectively permeable membrane toward the side with lower water potential.

(C) This organelle supports aerobic respiration and ATP production in eukaryotic cells.

(D) Total mass is conserved in a chemical reaction when all matter is accounted for.

4. Which statement correctly describes Osmosis? **1**

(A) The product of mass and velocity is a vector quantity.

(B) Water moves across a selectively permeable membrane toward the side with lower water potential.

(C) A homogeneous mixture has solute particles distributed uniformly in a solvent.

(D) Particles oscillate parallel to the direction in which a disturbance travels.

5. Identify the term described by this statement: Solute mass divided by total solution mass, multiplied by 100, expresses mass-by-mass concentration. **1**

(A) Mass percentage

(B) Solution

(C) Mechanical advantage

(D) Isotope

6. Identify the term described by this statement: Atoms of the same element have equal proton numbers but different neutron numbers. **1**

(A) Inertia

(B) Isotope

(C) Conservation of mass

(D) Xylem

7. Which statement correctly describes Conservation of mass? **1**

(A) Total mass is conserved in a chemical reaction when all matter is accounted for.

(B) Solute mass divided by total solution mass, multiplied by 100, expresses mass-by-mass concentration.

(C) An object resists changes to its state of rest or uniform straight-line motion.

(D) One parent produces offspring without the fusion of gametes.

8. Which statement correctly describes Plasma membrane? **1**

(A) A selectively permeable boundary regulates exchange between a cell and its surroundings.

(B) One parent produces offspring without the fusion of gametes.

(C) The product of mass and velocity is a vector quantity.

(D) Atoms of the same element have equal proton numbers but different neutron numbers.

9. Which statement correctly describes Asexual reproduction? **1**

(A) Solute mass divided by total solution mass, multiplied by 100, expresses mass-by-mass concentration.

(B) One parent produces offspring without the fusion of gametes.

(C) A selectively permeable boundary regulates exchange between a cell and its surroundings.

(D) A plant tissue conducts water and dissolved minerals and also contributes mechanical support.

10. Identify the term described by this statement: The product of mass and velocity is a vector quantity. **1**

(A) Nitrogen cycle

(B) Binomial nomenclature

(C) Momentum

(D) Kinetic energy

11. Identify the term described by this statement: Particles oscillate parallel to the direction in which a disturbance travels. 1

(A) Binomial nomenclature
(B) Longitudinal wave
(C) Kinetic energy
(D) Plasma membrane

12. Which statement correctly describes Meristem? 1

(A) A region of actively dividing plant cells supports growth.
(B) An atom's combining capacity is associated with the electrons involved in bonding.
(C) Atoms of the same element have equal proton numbers but different neutron numbers.
(D) A selectively permeable boundary regulates exchange between a cell and its surroundings.

13. Identify the term described by this statement: A scientific name combines a genus name and a specific epithet using standard conventions. 1

(A) Mass percentage
(B) Binomial nomenclature
(C) Asexual reproduction
(D) Chromatography

14. Which statement correctly describes Chromatography? 1

(A) Components separate through different interactions with moving and stationary phases.
(B) Velocity changes by equal amounts during equal time intervals.
(C) A region of actively dividing plant cells supports growth.
(D) Energy associated with motion is one half of mass times speed squared for non-relativistic motion.

15. Which statement correctly describes Uniform acceleration? 1

(A) Water moves across a selectively permeable membrane toward the side with lower water potential.
(B) Velocity changes by equal amounts during equal time intervals.
(C) Particles oscillate parallel to the direction in which a disturbance travels.
(D) An atom's combining capacity is associated with the electrons involved in bonding.

16. Which statement correctly describes Mechanical advantage? 1

(A) Load divided by effort measures a machine's force multiplication.

(B) Water moves across a selectively permeable membrane toward the side with lower water potential.

(C) A homogeneous mixture has solute particles distributed uniformly in a solvent.

(D) Energy associated with motion is one half of mass times speed squared for non-relativistic motion.

17. Identify the term described by this statement: Energy associated with motion is one half of mass times speed squared for non-relativistic motion. 1

(A) Kinetic energy

(B) Longitudinal wave

(C) Binomial nomenclature

(D) Solution

18. Which statement correctly describes Nitrogen cycle? 1

(A) A homogeneous mixture has solute particles distributed uniformly in a solvent.

(B) One parent produces offspring without the fusion of gametes.

(C) The product of mass and velocity is a vector quantity.

(D) Biological and physical processes transfer nitrogen between the atmosphere, organisms and the environment.

19. Which statement correctly describes Inertia? 1

(A) Energy associated with motion is one half of mass times speed squared for non-relativistic motion.

(B) A plant tissue conducts water and dissolved minerals and also contributes mechanical support.

(C) An object resists changes to its state of rest or uniform straight-line motion.

(D) A selectively permeable boundary regulates exchange between a cell and its surroundings.

20. Which statement correctly describes Valency? 1

(A) Energy associated with motion is one half of mass times speed squared for non-relativistic motion.

(B) The product of mass and velocity is a vector quantity.

(C) A scientific name combines a genus name and a specific epithet using standard conventions.

(D) An atom's combining capacity is associated with the electrons involved in bonding.

Section B - Short responses

21. A student predicts that seeds supplied with water will germinate more often than dry seeds. Identify a measurable outcome and one condition to keep the same. 2

22. Compare Mass percentage and Chromatography. Give the meaning and an appropriate application of each. 2

23. A resultant force of 108 N acts on a 36 kg object. Calculate acceleration. 2

24. Explain how the following example illustrates Uniform acceleration: A cart gains 2 metres per second of velocity every second along a straight track. 2

25. A wave has frequency 380 Hz and wavelength 2 m. Calculate speed. 2

26. Explain how the following example illustrates Binomial nomenclature: Homo sapiens has a capitalised genus and a lowercase specific epithet. 2

Section C - Short responses

27. A 36 kg object moves at 5 m/s. Calculate its kinetic energy. 3

28. Compare Isotope and Valency. Give the meaning and an appropriate application of each. 3

29. A body starts from rest with acceleration 24 m/s^2 for 4 s. Calculate its displacement. **3**

30. Explain how the following example illustrates Mitochondrion: An actively contracting muscle cell needs a substantial ATP supply. **3**

31. A resultant force of 126 N acts on a 42 kg object. Calculate acceleration. **3**

32. Explain how the following example illustrates Solution: Salt dissolves uniformly in water without visible settling. **3**

33. A wave has frequency 420 Hz and wavelength 2 m. Calculate speed. **3**

Section D - Extended responses

34. (a) Explain Conservation of mass and analyse this application: The total mass of a sealed reaction vessel remains unchanged after reaction. **5**
(b) Explain Inertia and show how this second application fits it: A passenger tends to continue moving forward when a bus brakes.

35. (a) Explain Longitudinal wave and analyse this application: Sound in air produces alternating compressions and rarefactions. **5**
(b) Explain Asexual reproduction and show how this second application fits it: Yeast can reproduce by budding under suitable conditions.

36. (a) Explain Mechanical advantage and analyse this application: An effort of 40 N supports a load of 120 N in a simple machine. **5**
(b) Explain Osmosis and show how this second application fits it: A raisin swells after soaking in water.

Section E - Case and application questions

37. Consider this situation: At equal velocity, a loaded trolley has greater momentum than an empty one.

(a) Name the concept demonstrated in the case. 1

(b) Explain the connection between the situation and that concept. 1

(c) Distinguish that concept from Conservation of mass, giving an appropriate feature of each. 2

38. Consider this situation: Colours in a water-soluble ink separate as water moves along paper.

(a) Name the concept demonstrated in the case. 1

(b) Explain the connection between the situation and that concept. 1

(c) Distinguish that concept from Mass percentage, giving an appropriate feature of each. 2

39. Consider this situation: Magnesium commonly forms a 2+ ion by losing two electrons.

(a) Name the concept demonstrated in the case. 1

(b) Explain the connection between the situation and that concept. 1

(c) Distinguish that concept from Isotope, giving an appropriate feature of each. 2

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