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Class 9 - Science

Date: 01-10-2025

Section A - Multiple Choice Questions

Q1. Which state of matter has definite volume but no definite shape? (1 marks)

a. Solid
b. Liquid
c. Gas
d. Plasma

Q2. The mass of one mole of Nitrogen atoms is: (1 marks)

a. 14 u
b. 28 g
c. 14 g
d. 14 kg

Q3. If a moving object suddenly stops, a person sitting inside tends to fall forward. This is due to: (1 marks)

a. Centripetal force
b. Inertia of rest
c. Inertia of motion
d. Newton's Third Law

Q4. The powerhouse of the cell is: (1 marks)

a. Endoplasmic Reticulum
b. Mitochondria
c. Lysosome
d. Nucleus

Q5. Which group of organisms possesses an open circulatory system and jointed appendages? (1 marks)

a. Mollusca
b. Annelida
c. Arthropoda

d. Nematoda

Q6. When a force of 1 N is applied to a body of 1 kg mass, the resulting acceleration is: (1 marks)

a. 1 m/s^2
b. 10 m/s^2
c. 9.8 m/s^2
d. 0.1 m/s^2

Section B - Fill in the Blanks

Q7. The cell wall of plants is primarily composed of . (1 marks)

Q8. A heterogeneous mixture in which the solute particles do not settle down and are large enough to scatter light is called a . (1 marks)

Q9. The frequency of sound is measured in the unit . (1 marks)

Q10. The amount of energy required to change 1 kg of a liquid to gas at atmospheric pressure at its boiling point is called the Latent heat of . (1 marks)

Q11. Plant tissues responsible for increase in girth and primary growth are collectively known as tissues. (1 marks)

Q12. The maximum number of electrons that can be accommodated in the K shell of an atom is . (1 marks)

Section C - Short Answer Questions

Q13. Calculate the number of moles for 52 g of Helium (He). (Atomic mass of He = 4 u). (3 marks)

Q14. Define Kinetic Energy. A body of mass 10 kg is moving with a velocity of 2 m/s. Calculate its Kinetic Energy. (3 marks)

Q15. State three differences between Tendon and Ligament. (3 marks)

Q16. Explain Rutherford’s observation regarding the scattering of alpha particles in his experiment. (3 marks)

Q17. What is latent heat of fusion? Explain why the temperature of ice-water mixture remains constant at 0°C until all the ice melts. (3 marks)

Q18. If the acceleration due to gravity on the surface of the Earth is 9.8 m/s^2, what will be the acceleration due to gravity (g) at a height equal to the radius of the Earth (R)? (3 marks)

Section D - Long Answer Questions

Q19. Differentiate between Crystalline solids, Amorphous solids, and Colloids based on particle size, stability, and filtration method. Give one example of each. (5 marks)

Q20. State the Law of Conservation of Energy. A machine does 1000 J of work in 10 seconds. Calculate the Power consumed. If the same machine performs 2000 J of work in 5 seconds, how does its power output change? (5 marks)

Q21. Draw a neat, labeled diagram of a typical Plant Cell. List three cellular components present in a plant cell but absent in an animal cell. (5 marks)

Q22. What is relative molecular mass? Calculate the formula unit mass of Calcium Chloride ($CaCl_2$). (Given atomic masses: Ca = 40 u, Cl = 35.5 u). If you have 0.2 mole of water (H_2O), calculate the mass in grams. (H=1 u, O=16 u). (5 marks)

Q23. What are the characteristics of the Phylum Pisces (Fishes)? Classify five classes of Vertebrata, giving one example for each class. (5 marks)

Q24. State Newton’s Universal Law of Gravitation. How does the value of 'G' (Universal Gravitational Constant) differ from 'g' (Acceleration due to gravity)? List any three applications or consequences of the Universal Law of Gravitation. (5 marks)

Section F - Case Study

Q25. A student, Rahul, was observing the speed of a car driven by his father. The father drove the car for 40 minutes and covered a distance of 60 km. For the first 15 minutes, the car covered 20 km, and for the remaining time, it covered 40 km. (i) What was the total distance covered in meters? (ii) Calculate the average speed of the car in km/h. (iii) Was the car moving with uniform motion throughout the journey? Justify your answer. (4 marks)

Q26. A biology teacher showed students two types of specialized cells: Cell A, which was elongated, multinucleated, and striated, and Cell B, which was highly elongated, with finger-like processes (dendrites) and a long tail (axon). (i) Identify Cell A and state its primary location. (ii) Identify Cell B and mention the specific function performed by its axon. (iii) What is the fundamental difference in the function of these two cells, related to movement and transmission? (4 marks)