GG RS LEARNING HUB PVT. LTD.

NSO Class 09

Total Questions: 35 Time: 60 min

Physics

1. A ball is thrown vertically upwards with a velocity of 49 m/s. What is the total distance it travels before returning to the thrower's hand? (Take g=9.8 m/s2)

(A) 122.5 m

(B) 245 m

(C) 490 m

(D) 98 m

2. An object of mass 10 kg is moving with a uniform velocity of 10 m/s. A constant force is applied for 4 s on it, producing a velocity of 2 m/s in the opposite direction. The magnitude of the force applied is:

(A) -30 N

(B) 30 N

(C) -20 N

(D) 20 N

3. The graph shows the velocity-time relationship for a moving object. What is the **total displacement** of the object in 6 seconds?

(A) 16 m

(B) 20 m

(C) 24 m

(D) 12 m

4. A man weighing 600 N on Earth travels to a planet where the acceleration due to gravity is one-sixth that of Earth. What will be his mass and weight on the new planet? (Take gEarth =10 m/s2)

(A) Mass: 60 kg, Weight: 600 N

(B) Mass: 10 kg, Weight: 100 N

(C) Mass: 60 kg, Weight: 100 N

(D) Mass: 10 kg, Weight: 60 N

5. A sound wave has a frequency of 2 kHz and a wavelength of 35 cm. How long will it take to travel 1.4 km?

(A) 2 s

(B) 2.5 s

(C) 1 s

(D) 4 s

6. An object of mass 'm' is dropped from a height 'h'. Just as it hits the ground, its kinetic energy is K. What is its potential energy when it is at a height of h/4 from the ground?

(A) K/4

(B) 3K/4

(C) K

(D) K/2

7. A stone is dropped from the top of a tower. It covers 24.5 m in the last second of its journey. The height of the tower is: (Take g=9.8 m/s2)

(A) 44.1 m

(B) 39.2 m

(C) 78.4 m

(D) 58.8 m

8. An iron cube of side 10 cm is kept on a horizontal table. If the density of iron is 7800 kg/m3, the pressure exerted by the cube on the table is: (Take g=10 m/s2)

(A) 780 Pa

(B) 7800 Pa

(C) 78 Pa

(D) 78000 Pa

9. Two objects, A and B, have masses m and 4m respectively. If they have the same kinetic energy, what is the ratio of their momenta (pA:pB)?

(A) 1 : 2

(B) 2 : 1

(C) 1 : 4

(D) 4 : 1

10. Which of the following statements is incorrect regarding ultrasound?

(A) It is used in SONAR to detect underwater objects.

(B) It is used by bats for navigation (echolocation).

(C) Its frequency is below the human audible range (< 20 Hz).

(D) It is used in medical diagnostics to image internal organs.

11. A rifle of mass 5 kg fires a bullet of mass 50 g with an initial velocity of 100 m/s. What is the initial recoil velocity of the rifle?

(A) -1 m/s

(B) -2 m/s

(C) -0.5 m/s

(D) -10 m/s

12. A car is moving up a hill. The total energy of the car:

(A) Increases as potential energy increases and kinetic energy decreases.

(B) Decreases as potential energy increases and kinetic energy decreases.

(C) Remains constant, as potential energy converts to kinetic energy.

(D) Remains constant, assuming no friction, due to the law of conservation of energy.

Chemistry □

13. What is the number of atoms present in 4.25 g of ammonia (NH3)? (Atomic mass: N=14 u, H=1 u; Avogadro's number = 6.022×1023 mol−1)

(A) 1.505×1023

(B) 6.022×1023

(C) 1.003×1024

(D) 0.25×1023

14. The isotopes of an element have:

(A) The same number of neutrons but a different number of protons.

(B) The same physical properties due to the same mass number.

(C) The same chemical properties due to the same number of electrons.

(D) Different atomic numbers but the same mass number.

15. A student performs chromatography on a sample of ink. The setup is shown below. What is the fundamental principle behind this separation technique?

(A) Different components have different boiling points.

(B) Different components have different solubilities in the same solvent and are adsorbed to different extents.

(C) Different components have different densities.

(D) Different components are magnetic to different extents.

16. Which of the following represents a correct chemical formula and the names of the ions involved?

(A) AlSO4 (Aluminium Sulphate)

(B) Ca(NO3)2 (Calcium Nitrate)

(C) Na(PO4)3 (Sodium Phosphate)

(D) MgOH (Magnesium Hydroxide)

17. Which of the following observations does NOT support Rutherford's model of the atom?

(A) Most of the alpha particles passed straight through the gold foil.

(B) A few alpha particles were deflected by small angles.

(C) One out of every 12,000 particles appeared to rebound.

(D) Electrons revolve in discrete orbits without radiating energy.

18. A solution is prepared by dissolving 40 g of common salt in 320 g of water. The mass by mass percentage of the solution is:

(A) 12.5%

(B) 11.1%

(C) 88.9%

(D) 10%

19. Which of the following processes involves an increase in the potential energy of the particles?

(A) Condensation of steam

(B) Freezing of water

(C) Sublimation of iodine

(D) Deposition of frost

20. A mixture of ammonium chloride and sand can be separated by:

(A) Filtration followed by evaporation.

(B) Magnetic separation.

(C) Sublimation followed by condensation.

(D) Fractional distillation.

21. An element X has a valency of 3. What is the formula for its oxide and sulphate?

(A) XO3,X2(SO4)3

(B) X3O2,X3SO4

(C) X2O3,X(SO4)3

(D) X2O3,X2(SO4)3

22. A Tyndall effect is observed when a beam of light passes through:

(A) A true solution like salt in water.

(B) A colloidal solution like milk.

(C) A pure solvent like water.

(D) A gas like pure oxygen.

23. Calculate the molecular mass of hydrated copper sulphate ($CuSO_4 \cdot 5H_2O$). (Atomic mass: Cu=63.5, S=32, O=16, H=1)

(A) 159.5 u

(B) 185.5 u

(C) 249.5 u

(D) 177.5 u

Biology

24. A cell placed in a hypotonic solution swells up and may burst. This is due to the process of:

(A) Exosmosis

(B) Endosmosis

(C) Plasmolysis

(D) Active transport

25. Which of the following tissues has cells with unevenly thickened walls at the corners due to pectin deposition and provides flexible mechanical support?

(A) Parenchyma

(B) Collenchyma

(C) Sclerenchyma

(D) Chlorenchyma

26. Based on the Linnaean hierarchy of classification, which of the following groups contains the most closely related organisms?

(A) Class

(B) Order

(C) Family

(D) Genus

27. A farmer notices that the leaves of his crops are turning yellow, and the growth is stunted. This indicates a deficiency of a macronutrient that is a major constituent of proteins and nucleic acids. Which nutrient is it?

(A) Iron

(B) Nitrogen

(C) Manganese

(D) Zinc

28. The diagram shows a neuron. What is the correct pathway of a nerve impulse through this cell?

(A) Axon terminal → Axon → Cyton → Dendrite

(B) Dendrite → Cyton → Axon → Axon terminal

(C) Cyton → Dendrite → Axon terminal → Axon

(D) Axon → Cyton → Dendrite → Axon terminal

29. Which of the following is incorrectly matched?

(A) Mitochondria - ATP synthesis

(B) Ribosomes - Protein synthesis

(C) Lysosomes - Suicidal bags

(D) Golgi apparatus - Storage of starch and lipids

30. An organism is eukaryotic, multicellular, heterotrophic, and has a cell wall made of chitin. To which kingdom does it belong?

(A) Monera

(B) Protista

(C) Fungi

(D) Plantae

31. Biomagnification refers to:

(A) The increase in the concentration of a persistent toxicant at successive trophic levels.

(B) The process of converting atmospheric nitrogen into usable forms.

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(C) The variety of life forms found in a particular region.

(D) The depletion of the ozone layer by CFCs.

32. A person is diagnosed with a disease caused by a protozoan, transmitted by the bite of a female Anopheles mosquito. The person is suffering from:

(A) Dengue

(B) Chikungunya

(C) Malaria

(D) Elephantiasis

33. Which of the following is a feature of cardiac muscle tissue?

(A) Voluntary, striated, and multinucleated.

(B) Involuntary, unstriated, and uninucleated.

(C) Involuntary, striated, and uninucleated with intercalated discs.

(D) Voluntary, unstriated, and spindle-shaped.

34. In the carbon cycle, which process removes carbon dioxide from the atmosphere?

(A) Respiration by plants and animals.

(B) Combustion of fossil fuels.

(C) Decomposition of organic matter.

(D) Photosynthesis by plants.

35. A cross between a tall pea plant (TT) and a short pea plant (tt) results in progeny that are all tall. This is because:

(A) The trait for tallness is dominant.

(B) The trait for shortness is dominant.

(C) Both traits are codominant.

(D) The progeny are genetically identical to the short parent.