14/06/2020

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Code-A

Aakash
Medical | IIT-JEE | Foundations
(Divisions of Aakash Educational Services Limited)

Regd. Office **:** Aakash Tower, 8, Pusa Road, New Delhi-110005, Ph.011-47623456

MM : 45

iTutor Fortnightly Test Series

Time : 90 min.

(*for* NEET-2022)

Subjective Test –I (H.A.)

Topics covered :

Physics **:** **Physical World, Units & Measurements, Motion in a Straight Line:** Introduction, Position, Path length and displacement, Average velocity & average speed., Differential calculus, Applications of differential calculus, Instantaneous velocity & speed, Acceleration.

Chemistry **:** **Some Basic Concepts of Chemistry, Structure of Atom: Sub-atomic particles :** Discovery of electron, Charge to mass ratio of electron, Charge on electron, Discovery of proton and neutron. Thomson model of atom, Rutherford's nuclear model of atom, Atomic and Mass number, Isobars and isotopes., Particle nature of electromagnetic radiation : Plank's quantum theory, Photoelectric effect, Dual behaviour of electromagnetic radiation.

Biology **:** **Cell: The Unit of Life, Cell Cycle & Cell Division, The living world** (Upto Systematics)

Structural organisation in Animals–Animal Tissues, Biomolecules (upto Induced fit theory)

PHYSICS

Q1. The number of significant figures in number 2.3040 is **[1]**

(a) 1 (b) 3 (c) 4 (d) 5

Q2. Name the SI unit of (i) temperature (ii) electric current. **[1]**

Q3. Gravitational forces follows _____ square law. **[1]**

Q4. The position x of particle, moving along a straight line, varies with time t as $x = 6 + 12t - 2t^2$ where x is in metre and t in second. What is the distance travelled by the particle in first 5 seconds? **[2]**

Q5. Name the physical quantity, corresponding to slope of the position-time graph at a particular instant. State whether this quantity is a scalar or vector. **[2]**

Q6. (a) What is zero error? **[1]**

(b) The length and breadth of a rectangle are measured as $(a \pm \Delta a)$ and $(b \pm \Delta b)$ respectively. Find (i) relative error (ii) absolute error in measurement of area. **[2]**

OR

(a) What do you mean by central forces? **[1]**

(b) Differentiate $y = x \cdot e^x$ w.r.t. x. **[2]**

Q7. (a) (i) Each side of cube is measured to be 5.2 m. What is the total surface area of cube to appropriate significant figure? **[1]**

(ii) The radius of sphere is measured to be (2.1 ± 0.5) cm. Calculate percentage error in its surface area. **[2]**

(b) The velocity of a particle at any time t, is given by $v = a + bt + \frac{c}{d+t}$. What are the dimensions of $\frac{a}{c}$? **[2]**

OR

(a) Show that magnitude of average velocity of an object over an interval of time is either smaller than or equal to the average speed of object over the same interval. **[2]**

(b) The position of a particle moving on x-axis is given by $x = At^3 + Bt^2 + Ct + D$. The numerical value of A, B, C and D are 1, 4, –2 and 5 respectively and SI unit are used. What is the velocity of particle at t = 4 s. **[3]**

CHEMISTRY

Q8. What is the S.I. unit of density? **[1]**

Q9. Formula mass is used instead of molecular mass for **[1]**

(a) NaCl (b) H_2O (c) CO_2 (d) NH_3

Q10. Calculate the mass percent of sodium, sulphur and oxygen in sodium sulphate (Na_2SO_4). **[2]**

Q11. Calculate the number of electrons, protons and neutrons in the following **[2]**

(a) $^{14}_{7}N^{3-}$ (b) $^{24}_{12}Mg^{2+}$

Q12. (i) Calculate the frequency and time period of an electromagnetic wave whose wave number is 7.8 m^{-1}. **[3]**

(ii) Also calculate the energy associated with the given electromagnetic wave. **[1]**

OR

(i) What is the work function of the metal whose threshold wavelength (λ_0) is 33.33 nm. **[2]**

(ii) Also calculate, the maximum kinetic energy of the photoelectron emitted when a light of energy 26.4 × 10^{-18} J falls on the surface of the given metal. **[2]**

Q13. (a) How many moles of NaOH are present in 500 mL of a 0.02 M NaOH solution? **[2]**

(b) Calculate the mole fraction of glucose in a solution prepared by mixing 4.5 g of glucose in 36g of water. Also calculate the mole fraction of water. **[3]**

OR

(a) Calculate the number of atoms of carbon and oxygen in 88 g of CO_2. **[2]**

(b) Calculate the concentration of H_2SO_4 in mol/L in a sample which has a density of 0.8 g mL^{-1} and the mass percent of H_2SO_4 in it is 49%? [Molar mass of H_2SO_4 = 98 g/mol] **[3]**

BIOLOGY

Q14. According to binomial nomenclature, the scientific name of mango. **[1]**

(a) Should have specific epithet starts with small letter

(b) Should be underlined when printed in italics

(c) Should include generic name only

(d) Should include author's name which is written in italics

Q15. The type of epithelial tissue is present in walls of blood vessels is **[1]**

(a) Cuboidal epithelium (b) Columnar epithelium

(c) Squamous epithelium (d) Compound epithelium

Q16. Draw a labelled diagram of mitochondria. **[2]**

OR

Name the most important form of energy currency in living system. What are its components? **[2]**

Q17. Define the following.

(a) Karyokinesis

(b) Cytokinesis

(c) Chiasmata **[3]**

Q18. Give the answers of following sections. **[3]**

(i) Name a carrier protein that transports glucose into cells.

(ii) How prosthetic groups are different from co-enzyme?

(iii) What is the most abundant chemical in living organisms?

Q19. (a) How many types of chromosomes are found based on the position of centromere? **[2]**

(b) How many phases are there in interphase? Describe them. **[3]**

OR

Classify and describe epithelial tissue on the basis of structural modification of cells. **[5]**

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