

IMU-CET
PHYSICS SAMPLE QUESTIONS – VOL.02

1. Pick up the correct statements :
 - (a) Area under a-t graph gives velocity
 - (b) Area under a-t graph gives change in velocity
 - (c) Path of projectile as seen by another projectile is a parabola
 - (d) A body, whatever be its motion, is always at rest in a frame of reference fixed to the body itself.

2. Choose the wrong statement :
 - (a) Zero velocity of a particle does not necessarily mean that its acceleration is zero.
 - (b) Zero acceleration of a particle does not necessary mean that its velocity is zero.
 - (c) If the speed of a particle is constant, its acceleration must be zero.
 - (d) None of these

3. A particle is acted upon by a constant force which is always perpendicular to the velocity of the particle. The motion of the particle takes place in a plane. It follows that
 - (a) Velocity is constant
 - (b) acceleration is constant
 - (c) Kinetic energy is variable
 - (d) it moves in a circular path

4. If for a particle the position is $x \propto t^2$ then :
 - (a) Velocity is constant
 - (b) acceleration is constant
 - (c) Acceleration is variable
 - (d) none

5. The directions of velocity and acceleration of a projectile at the highest point on the trajectory are
 - (a) Parallel to each other
 - (b) antiparallel to each other
 - (b) Perpendicular to each other

6. A constant force acts on a body of mass 0.9 kg at rest for 10s. If the body moves a distance of 250 m., the magnitude on the force is
 - (a) 8n
 - (b) 36N
 - (c) 4.0N
 - (d) 4.5 N

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7. An external force is required to keep a body in uniform motion. This statement was given by
(a) Aristotle (b) Newton
(c) Archimedes (d) Einstein
8. For a body of given mass, graph between velocity of the body and its linear momentum is
(a) a straight line with zero slope (b) a straight line with positive slope
(c) a straight line with negative slope (d) a parabola
9. Newton's first law defines
(a) Force only (b) inertia only
(c) both, force and inertia (d) Neither force nor inertia
10. The mud guards over the wheels of a car work on the basis of
(a) inertia of rest (b) inertia of direction
(c) inertia of motion (d) none of these
11. After effects of elasticity are maximum for
(a) Glass (b) Quartz
(c) Rubber (d) Metal
12. The Young's modulus of a wire of length L and radius r is YN / m^2 . If the length and radius are reduced to $L/2$ and $r/2$, then its Young's modulus will be
(a) $Y/2$ (b) Y
(c) $2Y$ (d) $4Y$
13. In the three states of matter, the elastic coefficient can be
(a) Young's modulus (b) coefficient of volume elasticity
(c) Modulus of rigidity (d) poisson's ratio
14. The bulk modulus for an incompressible liquid is
(a) zero (b) unity
(c) infinity (d) between 0 to 1

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15. The lower surface of a cube is fixed. On its upper surface, force is applied at an angle of 30° from its surface. The change will be of the type
- (a) Shape (b) Size
(b) None
16. If specific heat of a substance is infinite, it means
- (a) Heat is given out
(b) Heat is taken in
(c) No change in temperature takes place whether heat is taken in or given out
(d) All of the above
17. Compared to a burn due to water at 100°C , a burn due to steam at 100°C is
- (a) More dangerous (b) Less dangerous
(b) Equally dangerous (d) none of these
18. Amount of heat required to raise the temperature of a body through 1K is called its
- (a) Water equivalent (b) thermal capacity
(b) Entropy (d) Specific heat
19. It is hotter for the distance over the top of fire than it is in the side of it, mainly because
- (a) Air conducts heat upwards
(b) Heat is radiated upwards
(c) Convection takes more heat upwards
(d) Convection, conduction and radiation all contribute significantly transferring heat upwards.
20. If liquid is heated in weightlessness, the heat is transmitted through
- (a) conduction (b) convection (c) radiation
(d) neither, because the liquid cannot be heated in weightlessness

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21. If radius of earth is R then the height 'h' at which value of 'g' becomes one fourth is
- (a) $\frac{R}{4}$ (b) $\frac{3R}{4}$
(c) R (d) $\frac{R}{8}$
22. Radius of orbit of satellite of earth is R . Its kinetic energy is proportional to
- (a) $1/R$ (b) $1/\sqrt{R}$
(c) R (d) $1/R^{3/2}$
23. A particle falls towards earth from infinity. Its velocity on reaching the earth would be
- (a) Infinity (b) $\sqrt{2gR}$
(c) $2\sqrt{gR}$ (d) zero
24. At surface of earth weight of a person is 72 N then his weight at height $R/2$ from surface of earth is (R = radius of earth)
- (a) 28N (b) 16N
(c) 32N (d) 72 N
25. A satellite is launched into a circular orbit of radius R around the earth. A second satellite is launched into an orbit of radius $1.01 R$. The period of the second satellite is larger than the first one by approximately.
- (a) 0.5% (b) 1.0%
(c) 1.5% (d) 3.0%
26. The displacement equation of a particle is $x=3\sin 2t+4\cos 2t$. The amplitude and maximum velocity will be respectively
- (a) 5,10 (b) 3,2
(c) 4,2 (d) 3,4

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27. The total energy of a particle executing S.H.M. is proportional to
(a) Displacement from equilibrium position
(b) Frequency of oscillation
(c) Velocity in equilibrium position
(d) Square of amplitude of motion
28. A particle executes simple harmonic motion along a straight line with an amplitude A , the potential energy is maximum when the displacement is
(a) $\pm A$ (b) zero
(c) $\pm A/2$ (d) $\pm A/\sqrt{2}$
29. A body executes simple harmonic motion. The potential energy (P.E.) , the kinetic energy (K.E.) and total energy (T.E) are measured as a function of displacement x . Which of the following statements is true
(a) P.E. is maximum when $x = 0$
(b) K.E. is maximum when $x = 0$
(c) T.E. is zero when $x = 0$
(d) K.E. is maximum when x is maximum
30. The period of a simple pendulum is doubled, when
(a) Its length is doubled (b) the mass of the bob is doubled
(b) Its length is made four times
31. The dimensional formula of electric flux is
(a) $[M^1L^1T^{-2}]$ (b) $[M^1L^3T^{-3}A^{-1}]$
(c) $[M^2L^2T^{-2}A^{-2}]$ (d) $[M^1L^{-3}T^3A^1]$
32. The dimensional formula of electric intensity is
(a) $[M^1L^1T^3A^{-1}]$ (b) $[ML^{-1}T^{-3}A^1]$
(c) $[M^1L^1T^{-3}A^{-1}]$ (d) $[M^1L^2T^1A^1]$

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33. The force per unit charge is known as
(a) Electric flux (b) electric field
(c) Electric potential (d) electric current
34. The electric field at a point is
(a) Always continuous
(b) Continuous if there is no charge at that point
(c) Discontinuous if there is a charge at that point
(d) Both (b) and (c) are correct
35. In a region of constant potential
(a) The electric field is uniform.
(b) The electric field is zero.
(c) There can be no charge inside the region.
(d) Both (b) & (c) are correct

36. What is immaterial for an electric fuse wire
(a) Its specific resistance (b) its radius
(c) Its length (d) current flowing through it

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37. A 220 volt, 1000 W bulb is connected across a 110 volt mains supply. The power consumed will be
(a) 1000 W (b) 750 W
(c) 500 W (d) 250 W
38. A heater coil is cut into two equal parts and only one part is now used in the heater. The heat generated will now be
(a) One fourth (b) Halved
(c) Doubled (d) Four times

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39. A current I is passed for a time t through a number of voltmeters. If m is the mass of substance deposited on an electrode and z is its electrochemical equivalent, then

- (a) $\frac{zIt}{m} = \text{constant}$ (b) $\frac{z}{mIt} = \text{constant}$
(c) $\frac{1}{zmt} = \text{constant}$ (d) $\frac{It}{zm} = \text{constant}$

40. The thermocouple is based on the principle of

- (a) Seebeck effect (b) Thomson effect
(c) peltier effect (d) joule effect

41. The half-life of Bi^{210} is 5 days. What time taken by $(7/8)$ th part of the sample of decay

- (a) 3.4 days (b) 10 days
(c) 15 days (d) 20 days

42. On the bombardment of neutron with Boron. α -particle is emitted and product nuclei formed is

- (a) ${}_6\text{C}^{12}$ (b) ${}_3\text{Li}^6$
(c) ${}_3\text{Li}^7$ (d) ${}_4\text{Be}^9$

43. In nuclear reaction ${}_2\text{He}^4 + {}_z\text{X}^A \rightarrow {}_{z+2}\text{Y}^A + 3\text{H}^1 + \text{A}$, A denotes

- (a) Electron (b) Positron
(c) Proton (d) Neutron

44. The half life period of radium is 1600 years. The fraction of a sample of radium that would remain after 6400 years is

- (a) $\frac{1}{4}$ (b) $\frac{1}{2}$
(c) $\frac{1}{8}$ (d) $\frac{1}{16}$

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45. The half life period of radium is 1600 years. Its average life time will be
(a) 3200 years (b) 4800 years
(c) 2319 years (d) 4217 years

46. The dominant mechanisms for motion of charge carriers in forward and reverse biased silicon P-N junctions are
(a) Drift in forward bias, diffusion in reverse bias
(b) Diffusion in forward bias, drift in reverse bias
(c) Diffusion in both forward and reverse bias
(d) Drift in both forward and reverse bias

47. Boolean algebra is essentially based on

- (a) Truth (b) Logic
(c) symbol (d) Numbers

48. A logic gate is an electronic circuit which

- (a) Makes logic decisions
(b) Allows electrons flow only in one direction
(c) Works binary algebra
(d) Alternates between 0 and 1 values

49. The output of OR gate is 1

- (a) If both inputs are zero (b) if either or both inputs are 1
(c) Only if both input are 1 (d) if either input is zero

50. A semiconductor is cooled from T_1K to T_2K its resistance will

- (a) decrease (b) increase
(c) decreases then increases (d) will not change

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KEY ANSWERS									
1	B	11	A	21	C	31	B	41	C
2	A	12	B	22	A	32	C	42	C
3	B	13	B	23	B	33	B	43	D
4	B	14	C	24	C	34	D	44	D
5	C	15	D	25	C	35	D	45	C
6	D	16	C	26	A	36	C	46	B
7	A	17	A	27	D	37	D	47	B
8	B	18	B	28	A	38	C	48	B
9	C	19	C	29	B	39	A	49	B
10	B	20	A	30	C	40	A	50	B



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