Meritstore

PHYSICS NEET **TEST ID: Day 22 Physics**

Single Correct Answer Type

1. Identify the pair which has different dimensions
   a) Planck's constant and angular momentum
   b) Impulse and linear momentum
   c) Angular momentum and frequency
   d) Pressure and Young's modulus
2. If the length of rod A is $3.25 \pm 0.01\ cm$ and that of B is $4.19 \pm 0.01\ cm$ then the rod B is longer than rod A by
   a) $0.94 \pm 0.00\ cm$ b) $0.94 \pm 0.01\ cm$
   c) $0.94 \pm 0.02\ cm$ d) $0.94 \pm 0.005\ cm$
3. The velocity-time relation of an electron starting from rest is given by $v = kt$ where $k = 2\text{ms}^{-1}$. The distance traversed in first 3 s is
   a) 9 m b) 16 m c) 27 m d) 36 m
4. The height y and the distance x along the horizontal plane of a projectile on a certain planet (with no surrounding atmosphere) are given by $y = 8t - 5t^2$ metre and $x = 6t$ metre, where t is in second. The velocity with which the projectile is projected, is
   a) $14\ \text{ms}^{-1}$ b) $10\ \text{ms}^{-1}$
   c) $8\ \text{ms}^{-1}$ d) $6\ \text{ms}^{-1}$
5. In the above question, if the angular velocity is kept same but the radius of the path is halved, the new force will be
   a) $2F$ b) F^2 c) $F/2$ d) $F/4$
6. A body is moving along a rough horizontal surface with an initial velocity $6\ m/s$. If the body comes to rest after travelling $9m$, then the coefficient of sliding friction will be
   a) 0.4 b) 0.2 c) 0.6 d) 0.8
7. A block is moving up an inclined plane of inclination 60° with velocity of $20\ \text{ms}^{-1}$ and stops after 2.00 s. If $g = 10\text{ms}^{-2}$ then the approximate value of coefficient of friction is
   a) 3 b) 3.3 c) 0.27 d) 0.33
8. A bullet moving with a speed of 100 ms^{-1} can just penetrate two planks of equal thickness. Then the number of such planks penetrated by the same bullet when the speed is doubled will be
   a) 4 b) 8 c) 6 d) 10
9. Four particles of masses m, $2m$, $3m$ and $4m$ are arranged at the corners of a parallelogram with each inside equal to a and one of the angle between two adjacent sides is 60°. The parallelogram lies in the x-y plane with mass m at the origin and $4m$ on the x-axis. The centre of mass of the arrangement will be located at
   a) $\left(\frac{\sqrt{3}}{2}a, 0.95a\right)$ b) $\left(0.95a, \frac{\sqrt{3}}{4}a\right)$

c) $\left(\frac{3a}{4}, \frac{a}{2}\right)$ d) $\left(\frac{a}{2}, \frac{3a}{4}\right)$

10. In an orbital motion, the angular momentum vector is
    a) Along the radius vector
    b) Parallel to the linear momentum
    c) In the orbital plane
    d) Perpendicular to the orbital plane

11. Two particles of equal mass m go around a circle of radius R under the action of their mutual gravitational attraction. The speed of each particle with respect to their center of mass is
    a) $\sqrt{\frac{Gm}{R}}$ b) $\sqrt{\frac{Gm}{4R}}$ c) $\sqrt{\frac{Gm}{3R}}$ d) $\sqrt{\frac{Gm}{2R}}$

12. A copper bar of length L and area of cross-section A is placed in a chamber at atmospheric pressure. If the chamber is evacuated, the percentage change in its volume will be (compressibility of copper is $8 \times 10^{12} \mathrm{m^2 N^{-1}}$ and 1 atm $= 10^5 \mathrm{N\ m^2}$)
    a) 8×10^{-7} b) 8×10^{-5}
    c) 1.25×10^{-4} d) 1.25×10^{-5}

13. A small spherical ball falling through a viscous medium of negligible density has terminal velocity v. Another ball of the same mass but of radius twice that of the earlier falling through the same viscous medium will have terminal velocity
    a) v b) $\frac{v}{4}$ c) $\frac{v}{2}$ d) $2v$

14. A wooden ball of density ρ is immersed in water of density ρ_0 to depth h and then released. The height H above the surface of water upto which the ball jump out of water is
    a) Zero b) h c) $\frac{\rho_0 h}{\rho}$ d) $\left(\frac{\rho_0}{\rho} - 1\right) h$

15. A black body emits radiations of maximum intensity at a wavelength of 5000Å, when the temperature of the body is 1227°C. If the temperature of the body is increased by 2227°C, the maximum intensity of emitted radiation would be observed at
    a) 2754.8Å b) 3000Å c) 3500Å d) 4000Å

16. If $C_V = 4.96 cal/moleK$, then increase in internal energy when temperature of 2 moles of this gas is increased from 340 K to 342 K
    a) 27.80 cal b) 19.84 cal
    c) 13.90 cal d) 9.92 cal

17. 100 g of water is heated from30°C to 50°C.Ignoring the slight expansion of the water, the change in its internal energy is
    (Specific heat of water is 4184 J/kg/K)
    a) 8.4 kJ b) 84 kJ c) 2.1 kJ d) 4.2 kJ

18. Root mean square speed of the molecules of ideal gas is v. If pressure is increased two times at constant temperature, the rms speed will become
    a) $\frac{v}{2}$ b) v c) $2v$ d) $4v$

19. If a simple pendulum has significant amplitude (up to a factor of $1/e$ of original) only in the period between $t = 0s$ to $t = \tau s$, then τ may be called the average life of the pendulum. When the spherical bob of the pendulum suffers a retardation (due to

viscous drag) proportional to its velocity, with $'b'$ as the constant of proportionality, the average life time of the pendulum is (assuming damping is small) in seconds

a) $0.693/b$ b) b c) $1/b$ d) $2/b$

20. The motion of a particle varies with time according to the relation $y = a\sin\omega t + b\cos\omega t$

a) The motion is oscillatory but not SHM
b) The motion is SHM with amplitude a + b
c) The motion is SHM with amplitude $a^2 + b^2$
d) The motion is SHM with amplitude $\sqrt{a^2 + b^2}$

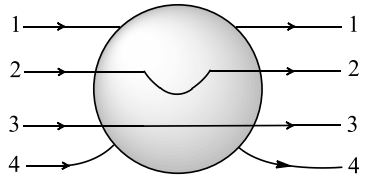
21. A source and an observer approach each other with same velocity $50\ m/s$. If the apparent frequency is $435 sec^{-1}$, then the real frequency is

a) $320\ s^{-1}$ b) $360 sec^{-1}$
c) $390 sec^{-1}$ d) $420 sec^{-1}$

22. A spherical condenser has inner and outer spheres of radii a and b respectively. The space between the two is filled with air. The difference between the capacities of two condensers formed when outer sphere is earthed and when inner sphere is earthed will be

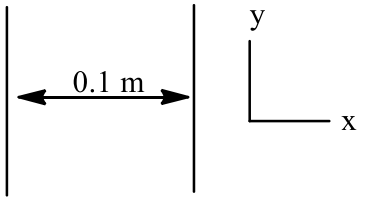
a) Zero b) $4\pi\varepsilon_0 a$
c) $4\pi\varepsilon_0 b$ d) $4\pi\varepsilon_0 a\left(\frac{b}{b-a}\right)$

23. A metallic solid sphere is placed in a uniform electric field. The lines of force follow the path(s) shown in figure as



a) 1 b) 2 c) 3 d) 4

24. Two insulating plates are both uniformly charged in such a way that the potential difference between them is $V_2 - V_1 = 20$V. (ie, plate 2 is at a higher potential). The plates are separated by $d = 0.1$m and can be treated as infinitely large. An electron is released from rest on the inner surface of plate 1. What is its speed when it hits plate 2? (e=1.6×10^{-19}C, $m_0 = 9.11 \times 10^{-31}$kg)



a) $2.65 \times 10^6 \text{ms}^{-1}$ b) $7.02 \times 10^{12} \text{ms}^{-1}$
c) $1.87 \times 10^6 \text{ms}^{-1}$ d) $32 \times 10^{-19} \text{ms}^{-1}$

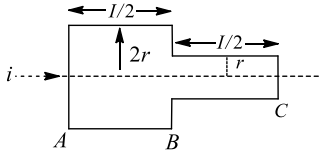
25. Two electroplating cells, one of silver and another of aluminium are connected in series. The ratio of the number of silver atoms to that of aluminium atoms deposited during time t will be

a) 1 : 3 b) 3 : 1 c) 1 : 9 d) 9 : 1

26. Two identical heaters of 220V , 1000 W are placed in parallel with each other across 220V line, then the combined power is

a) 1000 W b) 2000 W c) 500 W d) 4000 W

27. Two bars of radius r and $2r$ are kept in contact as shown. An electric current i is passed through the bars. Which one of the following is correct?



a) Heat produced in bar BC is 4 times the heat produced in bar AB
b) Electric field in both halves is equal
c) Current density across AB is doubled that of across BC
d) Potential difference across AB is 4 times that of across BC

28. A moving coil galvanometer gives full scale deflection, when a current of 0.005 A is passed through its coil. It is converted into a voltmeter reading upto 5V by using an external resistance of 975 Ω. What is the resistance of the galvanometer coil?

a) 30 Ω b) 25 Ω c) 50 Ω d) 40 Ω

29. A loop of area 0.5m^2 is placed in a magnetic field of strength 2 T in direction making an angle of 30° with the field. The magnetic flux linked with the loop will be

a) $\frac{1}{2}$Wb b) $\sqrt{\frac{3}{2}}$Wb c) 2 Wb d) $\frac{\sqrt{3}}{2}$Wb

30. On applying an external magnetic field, to a ferromagnetic substance domains
a) Align in the direction of magnetic field
b) Align in the direction opposite to magnetic field
c) Remain unaffected
d) None of the above

31. The self induced emf in a coils of 0.4 henry self inductance when current in it is changing at the rate of 50As^{-1}, is

a) 8×10^{-4}V b) 8×10^{-3}V
c) 200 V d) 500 V

32. What is the $r.m.s.$ value of an alternating current which when passed through a resistor produces heat which is thrice of that produced by a direct current of 2 amperes in the same resistor

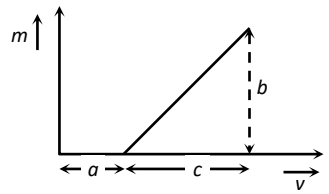
a) 6 *amp* b) 2 *amp*
c) 3.46 *amp* d) 0.66 *amp*

33. In a pure inductive circuit **or** In an ac circuit containing inductance only, the current
a) Leads the e.m.f. by 90°
b) Lags behind the e.m.f. by 90°
c) Sometimes leads and sometimes lags behind the e.m.f.
d) Is in phase with the e.m.f.

34. The sun delivers 10^3 Wm^{-2} of Electromagnetic flux on the earth's surface. The total power that is incident on a roof of dimensions 6m × 30m,is

a) 1.8×10^5 W b) 7.2×10^5 W
c) 0.9×10^5 W d) 4.5×10^5W

35. The graph shows how the magnification m produced by a convex thin lens varies with image distance v. What was the focal length of the used lines



a) b/c b) b/ca c) bc/a d) c/b

36. A vessel of depth 2d cm is half filled with a liquid of refractive index μ_1 and the upper half with a liquid of refractive index μ_2. The apparent depth of the vessel seen perpendicularly is

a) $d\left(\frac{\mu_1\mu_2}{\mu_1+\mu_2}\right)$ b) $d\left(\frac{1}{\mu_1}+\frac{1}{\mu_2}\right)$

c) $2d\left(\frac{1}{\mu_1}+\frac{1}{\mu_2}\right)$ d) $2d\left(\frac{1}{\mu_1\mu_2}\right)$

37. Through quantum theory of light we can explain a number of phenomena observed with light, it is necessary to retain the wave nature of light to explain the phenomenon of

a) Photoelectric effect b) Diffraction c) Compton effect d) Black body radiation

38. Four particles have same momentum. Which has maximum kinetic energy?

a) Proton b) Electron

c) Deuteron d) α- particle

39. K_α and K_β X-rays are emitted when there is a transition of electron between the levels

a) n=2 to n=1 and n=3 to n=1 respectively

b) n=2 to n=1 and n=3 to n=2 respectively

c) n=3 to n=2 and n=4 to n=2 respectively

d) n=3 to n=2 and n=4 to n=3 respectively

40. The ratio of minimum wavelengths of Lyman and Balmer series will be

a) 1.25 b) 0.25 c) 5 d) 10

41. What will be ratio of radii of Li^7 nucleus to Fe^{56}nucleus?

a) 1:3 b) 1:2 c) 1:8 d) 2:6

42. When a radioactive isotope $_{88}R^{228}$decay in series by the emission of 3α-particles and β-particle, the isotope finally formed is

a) $_{84}X^{228}$ b) $_{86}X^{222}$ c) $_{83}X^{216}$ d) $_{83}X^{215}$

43. A truth table is given below. Which of the following has this type of truth table

A	0	1	0	1
B	0	0	1	1
y	1	0	0	0

a) XOR gate b) NOR gate

c) AND gate d) OR gate

44. A carrier wave is modulated by a number of sine waves with modulation indices m_1, m_2, m_3, …, The total modulation index (m) of the wave is

a) $m_1+m_2+m_3+\ldots.$ b) $m_1-m_2+m_3+\ldots.$

c) $\sqrt{m_1^2+m_2^2+m_3^2+\ldots}$ d) $\sqrt{\frac{m_1^2+m_2^2+m_3^2+\ldots}{n}}$

45. An antenna is a device

a) That convert electromagnetic energy into radio frequency signal

b) That converts radio frequency signal into electromagnetic energy
c) That converts guided electromagnetic waves into free space electromagnetic waves and vice-versa
d) None of these