MHT-CET Practice Question Paper

Subject : Physics

Time: 45 minutes **Test no : 01** **Marks : 100**

All the questions are compulsory and contain two marks for each

1. Angular speed of hour of a clock in degree per second is
   a) 1/30 b) 1/60
   c) 1/120 d) 1/720
2. A cyclist taking turn bends inwards while a car passenger taking same turn is thrown outwards. The reason is
   a) Car is heavier than cycle.
   b) Car has 4 wheels while cycle has only 2.
   c) Difference in these speeds of the 2.
   d) Cyclist has to counteract centrifugal force while in the case of car, Only the passenger is thrown by this force.
3. For a particle moving in the vertical circle, the total energy at different positions along the path
   a) is conserved.
   b) increases.
   c) decreases.
   d) may increase or decrease.
4. A disc of radius 'R' and thickness R/6 has moment of inertia 'I' about an axis passing through its centre and perpendicular to its plane. Disc is melted and recast into a solid sphere. This moment of inertia of sphere about its diameter is
   a) I/5 b) I/6
   c) I/32 d) I/64
5. The pressure at the bottom of liquid tank is not proportional to the
   a) acceleration due to gravity
   b) density of the liquid
   c) hight of the liquid
   d) area of the liquid surface
6. Molecules on the surface of the liquid have
   a) maximum kinetic energy
   b) minimum kinetic energy
   c) maximum potential energy
   d) minimum potential energy
7. In a barometer, the mercury level is 76 cm at sea level. On a hill of height 3 km, if the ratio of the density of Hg to that of air is 10^4, the atmospheric pressure on the hill is
   a) 26 cm on Hg b) 46 cm on Hg
   c) 36 cm on Hg d) 56 cm on Hg
8. The perfect gas equation for 4 g of hydrogen gas is
   a) PV = RT b) PV = 2RT
   c) PV = ½RT d) PV = 4 RT
9. The mean free path of molecules of a gas (radius r) is inversely proportional to
   a) r^3 b) r^2
   c) r d) $\sqrt{r}$
10. Gases exert pressure on the walls of the container because of the gas molecules
    a) have finite volume
    b) obey Boyle's law
    c) possess momentum
    d) collide with one another
11. If the amount of heat given to a system is 35 J and the amount of work done on the system is 15 J, then the change in internal energy of the system is
    a) -50 J b) 20J
    c) 30 J d) 50 J
12. In diesel engine the cylinder compresses air from S.T.P to about 1/16 the original volume and a pressure of 50 atmosphere. The temperature of the compressed air is nearly
    a) 87.3 K b) 580 K
    c) 853 K d) 1126 K
13. In which of the following process heat is neither absorbed nor released by a system?
    a) isobaric b) isochoric
    c) isothermal d) adiabatic
14. The distance covered by a particle undergoing SHM in one time period is

(amplitude = A)
a) 4A b) Zero
c) A d) 2A

15. The equation of motion of a particle is $\frac{d^2y}{dt^2} + Ky = 0$, where K is positive constant. The time period of the motion is given by
a) $\frac{2\pi}{k}$ b) $2\pi K$
c) $\frac{2\pi}{\sqrt{K}}$ d) $2\sqrt{\frac{\pi}{b}}$
16. If the period of the oscillation of mass m suspended from a springs is 2 s, then the period of mass 4 m will be
a) 1 s b) 2 s
c) 3 s d) 4 s
17. Stationary waves antinodes are the points where there is
a) minimum displacement and minimum pressure change
b) minimum displacement and maximum pressure change
c) maximum displacement and maximum pressure change
d) maximum displacement and minimum pressure change
18. The waves set up in a closed pipe are
a) longitudinal and progressive
b) transverse and progressive
c) transverse ends stationary
d) longitudinal and stationary
19. It is possible to recognise a person by hearing this voice even if he is hidden behind a solid wall. This is due to the fact that his voice
a) has definite pitch
b) has a definite quality
c) has a definite capacity
d) can penetrate the wall
20. According to corpuscular theory of light which is not the property of light
a) the velocity of light in air is greater than in glass
b) light travels in straight lines
c) the velocity of light does not change after reflection
d) the velocity of light changes after reflection
21. For a radiation of 9 GHz passing through air. The number of waves passing through 1 m length is
a) 30 b) 5
c) 20 d) 3
22. Will light is refracted from a surface which of its following physical parameters does not change?
a) velocity b) amplitude
c) frequency d) wavelength
23. A charge Q is enclosed by a Gaussian spherical surface of radius R. If the radius is doubled then the outwork electric flux will
a) be double
b) increases four times
c) be reduced to half
d) remain the same
24. A moving positive charge approaches a negative charge. What will happen to the potential energy of the system?
a) may increases or decreases
b) will increases
c) will decreases
d) will remain constant
25. The system of two charges separated by a certain distance apart stores electrical potential energy. If the distance between them is increased, the potential energy of the system,
a) may increase or decrease
b) increases in any case
c) remains the same
d) decreases in any case
26. Nature of equipotential surface for a point charge is
a) ellipsoid with charge at foci
b) sphere with charge at the centre of the sphere
c) sphere with charge on the surface of the sphere
d) plane with charge on the surface
27. Kirchhoff's junction rule is a reflection of
a) conservation of momentum
b) conservation of current density vector
c) conservation of charges
d) conservation of energy

28. Six wires, each of resistance r, are connected so as to form a tetrahedron. The equivalent resistance of the combination when current enters through one corner and leaves through same other corner is
    a) r b) 2r
    c) r/3 d) r/2
29. A potentiometer is an accurate and versatile device to make electrical mechanical measurements of E.M.F because the method involves
    a) cells
    b) potential gradients
    c) condition of no current flow through the galvanometer
    d) a combination of cells, galvanometer and resistances
30. Positively charged particle projected towards east is deflected towards north by a magnetic field. The magnetic field may be
    a) towards West
    b) towards South
    c) upward
    d) downward
31. A cyclotron is used to accelerate
    a) only negatively charged particles
    b) neutron
    c) both positively and negatively charged particles
    d) only positively charged particles
32. If a velocity has both perpendicular and parallel components while moving through a magnetic field, what is the path followed by a charged particle?
    a) Circular
    b) Elliptical
    c) Linear
    d) Helical
33. If there is no torsion in the suspension threat, then the time period of a magnet executing SMH is
    a) $T = 2\pi\sqrt{\frac{I}{MB}}$ b) $T = \frac{1}{2\pi}\sqrt{\frac{MB}{I}}$
    c) $T = 2\pi\sqrt{\frac{MB}{I}}$ d) $T = \frac{1}{2\pi}\sqrt{\frac{I}{MB}}$
34. The gyromagnetic ratio of an electron = _____specific charge of an electron
    a) 4 b) 1/2
    c) 2 d) 1
35. The ratio of magnetic dipole moment of an electron of charge 'e' and mass 'm' in Bohr's orbit in hydrogen atom to its angular momentum is
    a) e/m b) m/e
    c) 2m/e d) e/2m
36. The magnetic flux linked with a coil varies with time as $\phi = 3t^2 + 4t + 9$ webers. The induced emf at t = 2 s is
    a) 10 V b) 1V
    c) 6 V d) 16 V
37. A coil having effective area A, is held with its plane normal to a magnetic field of induction B the magnetic induction is quickly reduced to 25% of its initial value in 2 s. then e.m.f. induced across the coil will be
    a) 3AB/8 b) 3AB/4
    c) AB/4 d) AB/2
38. A Straight conductor 0.1 m long moves in a uniform magnetic field of 0.1 T. The velocity of the conductor is 15 m/s and is directed perpendicular to the field. The e.m.f. induced between the two ends of the conductor is
    a) 0.10 V b) 0.15 V
    c) 1.50 V d) 15.00 V
39. The rms value of current in a 50 Hz AC circuit is 6 A. The average value of AC current over a cycle is
    a) $6\sqrt{2}$ b) $\frac{3}{\pi\sqrt{2}}$
    c) zero d) two
40. A capacitor 'C' is connected across a DC source, the reactance of capacitor will be_____.
    a) zero b) high
    c) low d) infinite
41. In the series LCR circuit, the power dissipation is through
    a) R b) L
    c) C d) Both L and C

42. One moving electron when comes closer to other stationary electron then its kinetic energy and potential energy respectively _____ and _____.
    a) increases, decreases
    b) increases, increases
    c) decreases, increases
    d) decreases, decreases

43. ____ is the wavelength of photon of energy 35 keV.
    a) 35×10^{-12} m b) 35 Å
    c) 3.5 nm d) 3.5 Å

44. The de-Broglie wavelength 'λ' of a particle
    a) is proportional to mass
    b) is proportional to impulse
    c) is inversely proportional to impulse
    d) does not depend on impulse

45. Which one of the series of hydrogen spectrum is in the visible region?
    a) Lyman series
    b) Balmer series
    c) Paschen series
    d) Bracket series

46. Number of spectral line in hydrogen atom is
    a) 6 b) 8
    c) 15 d) infinite

47. The period of revolution of an electron in the ground state of hydrogen atom is T. The period of revolution of the electron in the first excited state is
    a) 2 T b) 4 T
    c) 6 T d) 8 T

48. Constant DC voltage is required from a variable AC voltage which of the following is correct order of operation?
    a) regulator, filter, rectifier
    b) rectifier, regulator, filter
    c) rectifier, filter, regulator
    d) filter, regulator, rectifier

49. In a half wave rectifier the AC input source of frequency 50 Hz is used. The fundamental frequency of the output is
    a) 50 Hz b) 150 Hz
    c) 200 Hz d) 75 Hz

50. Which of the following semi-conducting devices is used as voltage regulator?
    a) LASER diode b) Zener diode
    c) Solar cell d) Photo diode