

Quiz: Physics set 5

Q201: A particle moves along x-axis with acceleration $a = 4 \text{ m/s}^2$. If its initial velocity is 2 m/s, its velocity after 5 s is:

- A) 12 m/s
- B) 18 m/s
- C) 22 m/s
- D) 24 m/s

Q202: A stone is dropped from rest from a height of 80 m. The time taken to reach the ground ($g = 10 \text{ m/s}^2$) is:

- A) 2 s
- B) 3 s
- C) 4 s
- D) 5 s

Q203: Two blocks of masses 2 kg and 3 kg are connected by a light string and pulled by a force of 10 N on a smooth surface. The acceleration of the system is:

- A) 1 m/s^2
- B) 2 m/s^2
- C) 3 m/s^2
- D) 5 m/s^2

Q204: A body of mass 1 kg moves in a circle of radius 1 m with speed 5 m/s. The centripetal force is:

- A) 5 N
- B) 10 N
- C) 25 N
- D) 50 N

Q205: The work done by gravity in lifting a mass m through height h is:

- A) mgh
- B) $-mgh$
- C) Zero
- D) Depends on path

Q206: A flywheel rotating at constant angular speed has:

- A) Angular acceleration zero
- B) Linear acceleration zero
- C) Torque zero always
- D) Momentum zero

Q207: If the radius of gyration of a body is k, its moment of inertia about the axis is:

- A) Mk^2
- B) Mk
- C) M/k^2
- D) k^2/M

Q208: The gravitational potential energy of a mass m at distance r from Earth's center is:

- A) $-GMm/r$
- B) GMm/r
- C) $-Gm/r$
- D) GM/r^2

Q209: The unit of pressure is equivalent to:

- A) J/m^3
- B) N/m
- C) $kg \cdot m/s^2$
- D) $J \cdot m$

Q210: For an ideal gas undergoing isochoric process, the work done is:

- A) Zero
- B) Maximum
- C) Minimum
- D) Infinite

Q211: The rms speed of oxygen molecules is greater than nitrogen at same temperature because:

- A) Lower molar mass
- B) Higher pressure
- C) Higher density
- D) Larger size

Q212: The phase difference between displacement and velocity in SHM is:

- A) $\pi/2$
- B) π
- C) 0
- D) 2π

Q213: The speed of sound in a gas depends on:

- A) Temperature
- B) Pressure only
- C) Density only
- D) Amplitude

Q214: The electric field at the center of a charged ring is:

- A) Zero
- B) Maximum
- C) Infinite
- D) Depends on charge

Q215: The unit of electric potential is:

- A) Volt
- B) Joule
- C) Coulomb
- D) Ampere

Q216: If a dielectric is inserted between capacitor plates, the capacitance:

- A) Increases
- B) Decreases
- C) Becomes zero
- D) Remains same

Q217: The microscopic form of Ohm's law is:

- A) $J = \sigma E$
- B) $V = IR$
- C) $E = V/d$
- D) $I = nqAv$

Q218: A current carrying conductor placed in magnetic field experiences:

- A) Magnetic force
- B) Electric force
- C) No force
- D) Gravitational force

Q219: The magnetic field due to Earth at equator is:

- A) Horizontal
- B) Vertical
- C) Zero
- D) Maximum

Q220: The energy stored in an inductor is:

- A) $(1/2)LI^2$
- B) LI
- C) I^2/L
- D) L/I^2

Q221: In AC circuit, impedance is minimum at:

- A) Resonance
- B) High frequency
- C) Low frequency
- D) Zero frequency

Q222: The unit of power factor is:

- A) No unit
- B) Watt
- C) Volt
- D) Ampere

Q223: A concave mirror produces a virtual image when the object is placed:

- A) Between pole and focus
- B) Beyond center
- C) At focus
- D) At infinity

Q224: The magnification produced by a convex lens for a virtual image is:

- A) Positive
- B) Negative
- C) Zero
- D) Less than 1

Q225: The fringe width in YDSE is directly proportional to:

- A) Wavelength
- B) Slit separation
- C) 1/screen distance
- D) Intensity

Q226: The stopping potential in photoelectric effect is independent of:

- A) Intensity
- B) Frequency
- C) Nature of metal
- D) Work function

Q227: The de Broglie wavelength of a particle is inversely proportional to:

- A) Momentum
- B) Velocity
- C) Mass
- D) Energy

Q228: The number of protons in a nucleus is called:

- A) Atomic number
- B) Mass number
- C) Neutron number
- D) Isotope number

Q229: The radius of a nucleus varies as:

- A) $A^{(1/3)}$
- B) A
- C) $1/A$
- D) A^2

Q230: The decay constant of a radioactive substance is related to half-life by:

- A) $\lambda = 0.693/T_{1/2}$
- B) $\lambda = T_{1/2}/0.693$
- C) $\lambda = 1/T_{1/2}$
- D) $\lambda = T_{1/2}$

Q231: In intrinsic semiconductor, number of electrons is equal to:

- A) Number of holes
- B) Zero
- C) Number of atoms
- D) Dopant atoms

Q232: The current gain alpha of a transistor is related to beta by:

- A) $\alpha = \beta/(1+\beta)$
- B) $\alpha = 1+\beta$
- C) $\alpha = 1/\beta$
- D) $\alpha = \beta-1$

Q233: The dimensional formula of electric field is:

- A) $MLT^{-3}I^{-1}$
- B) MLT^{-2}
- C) $MT^{-2}I^{-1}$
- D) LT^{-1}

Q234: The escape speed from Earth does not depend on:

- A) Mass of body
- B) Radius of Earth
- C) Mass of Earth
- D) g

Q235: The coefficient of linear expansion has unit:

- A) K^{-1}
- B) K
- C) m
- D) m/K

Q236: The restoring force in SHM is proportional to:

- A) Displacement
- B) Velocity
- C) Acceleration
- D) Time

Q237: The Doppler effect is applicable for:

- A) Sound and light
- B) Sound only
- C) Light only
- D) Mechanical waves only

Q238: The electric potential inside a hollow charged conductor is:

- A) Constant
- B) Zero
- C) Infinite
- D) Maximum

Q239: The direction of magnetic field around a current carrying conductor is given by:

- A) Right hand thumb rule
- B) Fleming's left hand rule
- C) Lenz's law
- D) Ampere's law

Q240: The quality factor of an LCR circuit at resonance depends on:

- A) L, C and R
- B) Only R
- C) Only L
- D) Only C

Q241: A real image is always:

- A) Inverted
- B) Erect
- C) Magnified
- D) Virtual

Q242: The refractive index of water with respect to air is:

- A) Greater than 1
- B) Less than 1
- C) Equal to 1
- D) Zero

Q243: The work function of a metal is expressed in:

- A) eV
- B) Watt
- C) Newton
- D) Tesla

Q244: The wavelength associated with a moving car is extremely small because:

- A) Mass is large
- B) Velocity is small
- C) h is small
- D) Energy is large

Q245: The unit of magnetic flux density is:

- A) Tesla
- B) Weber
- C) Henry
- D) Ampere

Q246: The half-life of a radioactive substance is 10 days. The time taken for activity to become one-fourth is:

- A) 20 days
- B) 10 days
- C) 5 days
- D) 40 days

Q247: The conductivity of metals decreases with increase in:

- A) Temperature
- B) Pressure
- C) Length
- D) Area

Q248: The logic gate whose output is always opposite to input is:

- A) NOT
- B) AND
- C) OR
- D) XOR

Q249: The SI unit of capacitance is:

- A) Farad
- B) Henry
- C) Ohm
- D) Volt

Q250: The center of mass of a system remains at rest if:

- A) Net external force is zero
- B) Internal forces are zero
- C) Energy is conserved
- D) Momentum is zero