

Quiz: Physics set 20

Q953: A particle moves with velocity $v = 6t - 2$ (m/s). The displacement in first 4 s is:

- A) 32 m
- B) 40 m
- C) 48 m
- D) 56 m

Q954: A projectile is fired with speed 40 m/s at an angle of 45 deg. The maximum height reached ($g = 10 \text{ m/s}^2$) is:

- A) 20 m
- B) 30 m
- C) 40 m
- D) 50 m

Q955: Two particles of masses 3 kg and 7 kg move with velocities 4 m/s and 2 m/s respectively in the same direction. The velocity of center of mass is:

- A) 2.6 m/s
- B) 2.8 m/s
- C) 3.2 m/s
- D) 3.6 m/s

Q956: The work done by a force $F = 5x^2$ (N) from $x = 0$ to $x = 2$ m is:

- A) 10 J
- B) 13.3 J
- C) 20 J
- D) 26.7 J

Q957: For a solid sphere rolling without slipping, the ratio of rotational kinetic energy to translational kinetic energy is:

- A) $2/5$
- B) $1/2$
- C) $3/5$
- D) $2/3$

Q958: The escape speed from a planet of radius R and mass M is proportional to:

- A) $\sqrt{M/R}$
- B) $\sqrt{R/M}$
- C) M/R
- D) R/M

Q959: The terminal velocity of a sphere falling through a viscous medium depends on:

- A) Square of radius
- B) Radius
- C) Viscosity only
- D) Density only

Q960: The SI unit of Young's modulus is:

- A) N/m^2
- B) N/m
- C) J
- D) kg/m^2

Q961: In an isochoric process for an ideal gas, the work done is:

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

Q962: The time period of a particle in SHM is independent of:

- A) Amplitude
- B) Mass
- C) Spring constant
- D) Length

Q963: The speed of sound in air increases with:

- A) Temperature
- B) Pressure at constant T
- C) Density
- D) Amplitude

Q964: The electric field inside a conducting sphere in electrostatic equilibrium is:

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

Q965: The SI unit of electric dipole moment is:

- A) $\text{C}\cdot\text{m}$
- B) $\text{N}\cdot\text{m}$
- C) J/C
- D) $\text{V}\cdot\text{m}$

Q966: If the area of plates of a capacitor is doubled, its capacitance becomes:

- A) Double
- B) Half
- C) Four times
- D) Unchanged

Q967: The drift velocity of electrons in a conductor is directly proportional to:

- A) Electric field
- B) Length
- C) Area
- D) Resistance

Q968: The magnetic field inside a long solenoid is:

- A) Uniform
- B) Zero
- C) Non-uniform
- D) Infinite

Q969: The SI unit of magnetic flux is:

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

Q970: The induced emf in a circuit is zero when magnetic flux is:

- A) Constant
- B) Increasing
- C) Decreasing
- D) Alternating

Q971: In a purely capacitive AC circuit, the average power consumed is:

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

Q972: The focal length of a convex mirror is:

- A) Negative
- B) Positive
- C) Zero
- D) Infinite

Q973: A convex lens forms an image at infinity when the object is placed at:

- A) Focus
- B) Center of curvature
- C) Infinity
- D) Pole

Q974: In Young's double slit experiment, fringe width is proportional to:

- A) Wavelength
- B) Slit separation
- C) $1/\text{Screen distance}$
- D) Intensity

Q975: The stopping potential in photoelectric effect depends on:

- A) Frequency of light
- B) Intensity of light
- C) Area of metal
- D) Time of exposure

Q976: The de Broglie wavelength of a particle increases when its:

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

Q977: The binding energy per nucleon is maximum for nuclei near mass number:

- A) 56
- B) 12
- C) 4
- D) 235

Q978: The SI unit of absorbed dose of radiation is:

- A) Gray
- B) Sievert
- C) Becquerel
- D) Curie

Q979: The conductivity of a semiconductor increases when:

- A) Temperature increases
- B) Temperature decreases
- C) Pressure increases
- D) Length increases

Q980: In a p-type semiconductor, the majority charge carriers are:

- A) Holes
- B) Electrons
- C) Protons
- D) Ions

Q981: The SI unit of electric potential is:

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

Q982: The escape speed from Earth depends on:

- A) Mass and radius of Earth
- B) Mass of body
- C) Atmospheric pressure
- D) Temperature

Q983: The SI unit of angular momentum is:

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

Q984: The coefficient of viscosity of liquids decreases with increase in:

- A) Temperature
- B) Pressure
- C) Density
- D) Volume

Q985: The pitch of sound depends on:

- A) Frequency
- B) Amplitude
- C) Intensity
- D) Speed

Q986: The electric potential inside a conductor is:

- A) Constant
- B) Zero
- C) Maximum at center
- D) Minimum at surface

Q987: The magnetic field inside a long solenoid is:

- A) Uniform
- B) Zero
- C) Non-uniform
- D) Infinite

Q988: The power factor of an AC circuit is:

- A) $\cos\phi$
- B) $\sin\phi$
- C) $\tan\phi$
- D) $1/\phi$

Q989: A convex mirror always forms an image which is:

- A) Virtual and erect
- B) Real and inverted
- C) Real and erect
- D) Virtual and inverted

Q990: The refractive index of a medium decreases when:

- A) Wavelength increases
- B) Frequency increases
- C) Density increases
- D) Optical density increases

Q991: The work function of a metal depends on:

- A) Nature of metal
- B) Intensity of light
- C) Frequency of light
- D) Area of surface

Q992: The energy of a photon is:

- A) $h\nu$
- B) hc
- C) h/ν
- D) h/λ^2

Q993: The decay constant of a radioactive element depends on:

- A) Nature of nucleus
- B) Temperature
- C) Pressure
- D) Chemical state

Q994: The Fermi level in an intrinsic semiconductor lies:

- A) At mid-gap
- B) Near conduction band
- C) Near valence band
- D) Outside bands

Q995: The logic gate that gives output 1 only when inputs are different is:

- A) XOR
- B) AND
- C) OR
- D) NOR

Q996: The SI unit of inductance is:

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

Q997: The phenomenon responsible for mirage is:

- A) Total internal reflection
- B) Refraction only
- C) Diffraction
- D) Scattering

Q998: The SI unit of current density is:

- A) A/m^2
- B) A/m
- C) C/m^2
- D) V/m

Q999: Magnetic susceptibility of a diamagnetic material is:

- A) Negative
- B) Positive
- C) Zero
- D) Infinite

Q1000: Faraday's law of electromagnetic induction states that induced emf is proportional to:

- A) Rate of change of magnetic flux
- B) Magnetic field
- C) Area of loop
- D) Resistance

Q1001: The SI unit of magnetic moment is:

- A) $\text{A}\cdot\text{m}^2$
- B) $\text{T}\cdot\text{m}$
- C) Wb
- D) $\text{N}\cdot\text{m}$

Q1002: The center of mass of an isolated system moves with constant velocity due to conservation of:

- A) Linear momentum
- B) Energy
- C) Angular momentum
- D) Force