

Quiz: Physics set 19

Q903: A particle moves along x-axis with position $x = 4t^3 - 3t$ (m). The acceleration at $t = 1$ s is:

- A) 18 m/s²
- B) 20 m/s²
- C) 24 m/s²
- D) 30 m/s²

Q904: A projectile is thrown with speed 28 m/s at an angle of 30 deg. The time of flight ($g = 9.8$ m/s²) is approximately:

- A) 2.8 s
- B) 3.0 s
- C) 3.5 s
- D) 4.0 s

Q905: Two blocks of masses 4 kg and 6 kg move together with velocity 5 m/s. The total kinetic energy of the system is:

- A) 125 J
- B) 150 J
- C) 200 J
- D) 250 J

Q906: The work done by force $F = 6x$ (N) in moving a particle from $x = 0$ to $x = 5$ m is:

- A) 50 J
- B) 60 J
- C) 75 J
- D) 90 J

Q907: For a body rolling without slipping, the ratio of rotational kinetic energy to total kinetic energy for a solid cylinder is:

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

Q908: The orbital speed of a satellite at height h above Earth's surface is proportional to:

- A) $1/\sqrt{R+h}$
- B) $\sqrt{R+h}$
- C) $1/(R+h)$
- D) $R+h$

Q909: The terminal velocity of a small sphere falling through a viscous medium depends on:

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

Q910: The dimensional formula of bulk modulus is:

- A) $ML^{-1}T^{-2}$
- B) MLT^{-2}
- C) M^0LT^{-2}
- D) ML^2T^{-2}

Q911: For an ideal gas undergoing isothermal expansion, the work done is given by:

- A) $nRT \ln(V_2/V_1)$
- B) $P(V_2-V_1)$
- C) Zero
- D) $nC_V\Delta T$

Q912: The maximum velocity of a particle in SHM of amplitude A and angular frequency omega is:

- A) ωA
- B) $\omega^2 A$
- C) A/ω
- D) ω/A

Q913: The speed of sound in air increases when:

- A) Temperature increases
- B) Pressure increases at constant T
- C) Density increases
- D) Humidity decreases

Q914: The electric field inside a uniformly charged spherical shell is:

- A) Zero
- B) Constant
- C) Maximum at center
- D) Depends on radius

Q915: The SI unit of electric potential energy is:

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

Q916: If the distance between plates of a capacitor is doubled, the capacitance becomes:

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

Q917: The drift velocity of electrons in a conductor is proportional to:

- A) Electric field
- B) Length of conductor
- C) Cross-sectional area
- D) Resistance

Q918: The magnetic field at the center of a circular loop of radius R carrying current I is:

- A) $\mu_0 I / 2R$
- B) $\mu_0 I / R$
- C) $\mu_0 R / I$
- D) μ_0 / IR

Q919: Two parallel conductors carrying currents in opposite directions will:

- A) Repel each other
- B) Attract each other
- C) Not interact
- D) Move perpendicular

Q920: The induced emf in a coil is zero when the magnetic flux linked with it is:

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

Q921: In a purely inductive AC circuit, the average power consumed is:

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

Q922: The focal length of a plane mirror is:

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

Q923: A concave mirror forms a virtual image when the object is placed:

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

Q924: In Young's double slit experiment, fringe width increases if:

- A) Wavelength increases
- B) Slit separation increases
- C) Screen distance decreases
- D) Intensity increases

Q925: The stopping potential in photoelectric effect depends on:

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

Q926: The de Broglie wavelength of a particle is inversely proportional to its:

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

Q927: The binding energy per nucleon is maximum for nuclei near mass number:

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

Q928: The SI unit of activity of a radioactive sample is:

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

Q929: The conductivity of a semiconductor increases when:

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

Q930: In an n-type semiconductor, the majority charge carriers are:

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

Q931: The SI unit of electric field intensity is:

- A) N/C
- B) Volt
- C) C/N
- D) J/C

Q932: The escape speed from Earth does not depend on:

- A) Mass of body
- B) Mass of Earth
- C) Radius of Earth
- D) Gravitational constant

Q933: The SI unit of angular momentum is:

- A) kg·m²/s
- B) kg·m/s
- C) N·m
- D) J

Q934: The coefficient of viscosity of liquids decreases with increase in:

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

Q935: The pitch of a sound depends on:

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

Q936: The electric potential inside a conductor is:

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

Q937: The magnetic field inside a long solenoid is:

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

Q938: The power factor of an AC circuit is:

- A) cosphi
- B) sinphi
- C) tanphi
- D) 1/phi

Q939: 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

Q940: The refractive index of a medium is inversely proportional to:

- A) Speed of light in medium
- B) Wavelength
- C) Frequency
- D) Amplitude

Q941: The work function of a metal depends on:

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

Q942: The energy of a photon is:

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

Q943: The decay constant of a radioactive element depends on:

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

Q944: The Fermi level in an intrinsic semiconductor lies:

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

Q945: The logic gate that gives output 1 when inputs are different is:

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

Q946: The SI unit of inductance is:

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

Q947: The phenomenon responsible for mirage is:

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

Q948: The SI unit of current density is:

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

Q949: Magnetic susceptibility of a diamagnetic material is:

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

Q950: 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

Q951: The SI unit of magnetic moment is:

- A) A·m²
- B) T·m
- C) Wb
- D) N·m

Q952: 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