Quiz: Physics set 9

Q401: A particle moves along a straight line with position x = 5t2 - 2t + 3 (m). The acceleration at t = 1 s is:

A) 10 m/s2
B) 8 m/s2
C) 5 m/s2
D) 0 m/s2

Q402: A body is thrown vertically upward with velocity 30 m/s. The maximum height reached (g = 10 m/s2) is:

A) 30 m
B) 40 m
C) 45 m
D) 50 m

Q403: Two bodies of masses 2 kg and 4 kg moving with velocities 10 m/s and 0 m/s respectively collide elastically. The final velocity of the 2 kg mass is:

A) -3.33 m/s
B) 0 m/s
C) 3.33 m/s
D) 6.67 m/s

Q404: The work done by a variable force F = 3x2 from x = 0 to x = 2 m is:

A) 8 J
B) 12 J
C) 16 J
D) 24 J

Q405: For a rolling body, the ratio of rotational kinetic energy to translational kinetic energy for a solid sphere is:

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

Q406: The time period of a satellite orbiting close to Earth is proportional to:

A) sqrtR
B) R
C) 1/sqrtR
D) R2

Q407: The terminal velocity of a sphere falling through a viscous fluid is proportional to:

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

Q408: The coefficient of linear expansion of a solid has unit:

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

Q409: In an adiabatic process, which quantity remains constant?

A) PV^gamma
B) PV
C) T/V
D) P/T

Q410: The total mechanical energy in SHM is proportional to:

A) Square of amplitude
B) Amplitude
C) Frequency
D) Time period

Q411: The speed of sound in a gas is independent of:

A) Pressure at constant temperature
B) Temperature
C) Density
D) Nature of gas

Q412: The electric field at a distance r from a long straight charged wire is proportional to:

A) 1/r
B) 1/r2
C) r
D) r2

Q413: The capacitance of a spherical conductor of radius R in air is:

A) 4piepsilon0R
B) epsilon0R
C) R/epsilon0
D) 4piR

Q414: If the current in a conductor is doubled, the drift velocity of electrons becomes:

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

Q415: The magnetic field at the center of a circular loop is proportional to:

A) Current
B) Radius
C) Resistance
D) Voltage

Q416: The force per unit length between two long parallel conductors carrying currents I1 and I2 separated by distance r is:

A) mu0I1I2/2pir
B) mu0I1I2/4pir
C) mu0I1I2/r
D) mu0I1I2/pir

Q417: The magnetic flux linked with a coil is doubled in 0.1 s. The induced emf is:

A) 20 V
B) 10 V
C) 5 V
D) 2 V

Q418: In an AC circuit, the power consumed is zero when the circuit contains only:

A) Inductor
B) Resistor
C) Resistor and capacitor
D) Resistor and inductor

Q419: The focal length of a convex lens placed in water (n > 1) compared to air will:

A) Increase
B) Decrease
C) Remain same
D) Become zero

Q420: A real image is formed by a convex lens when the object is placed:

A) Beyond focal length
B) Within focal length
C) At focus only
D) At infinity only

Q421: The angular width of central maximum in single slit diffraction is proportional to:

A) lambda/a
B) a/lambda
C) lambdaD
D) D/lambda

Q422: The photoelectric effect confirms the quantized nature of:

A) Light
B) Electron
C) Charge
D) Mass

Q423: The de Broglie wavelength of an electron decreases when:

A) Accelerating potential increases
B) Mass increases
C) Charge increases
D) Time increases

Q424: The binding energy of a nucleus is the energy required to:

A) Separate nucleons completely
B) Break an atom
C) Ionize electrons
D) Create nucleus

Q425: The SI unit of decay constant is:

A) s^-1
B) s
C) J
D) Bq

Q426: The conductivity of an intrinsic semiconductor at absolute zero is:

A) Zero
B) Maximum
C) Finite
D) Infinite

Q427: In a p-type semiconductor, the Fermi level lies closer to:

A) Valence band
B) Conduction band
C) Middle of gap
D) Outside bands

Q428: The current gain in common base transistor configuration is:

A) alpha
B) beta
C) gamma
D) delta

Q429: The dimensional formula of magnetic field is:

A) MT^-2I^-1
B) MLT^-2
C) MT^-1
D) ML2T^-2I^-1

Q430: The escape speed from Earth is independent of:

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

Q431: The coefficient of surface tension has unit:

A) N/m
B) N/m2
C) J
D) kg/m2

Q432: The restoring force in SHM is always directed towards:

A) Mean position
B) Extreme position
C) Direction of motion
D) Random

Q433: The Doppler effect occurs due to relative motion between:

A) Source and observer
B) Medium and observer
C) Source and medium
D) Wave and medium

Q434: The electric potential inside a charged conducting sphere is:

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

Q435: The magnetic field inside a long solenoid is:

A) Uniform
B) Zero
C) Increasing
D) Decreasing

Q436: The energy stored per unit volume in a magnetic field is:

A) B2/2mu0
B) mu0B2
C) B/mu0
D) mu0/B

Q437: The power factor of an AC circuit is cosphi where phi is the phase difference between:

A) Voltage and current
B) Charge and voltage
C) Current and resistance
D) Voltage and power

Q438: A concave mirror forms a real image when the object is placed:

A) Beyond focal length
B) Between pole and focus
C) At focus only
D) At infinity only

Q439: The refractive index of a medium is inversely proportional to:

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

Q440: The fringe width in Young’s double slit experiment increases if:

A) Wavelength increases
B) Slit separation increases
C) Screen distance decreases
D) Source intensity decreases

Q441: The stopping potential in photoelectric effect depends on:

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

Q442: The energy of a photon is inversely proportional to its:

A) Wavelength
B) Frequency
C) Speed
D) Amplitude

Q443: The radius of a nucleus depends on:

A) Mass number
B) Atomic number
C) Neutron number
D) Charge

Q444: The unit of activity of a radioactive sample is:

A) Becquerel
B) Gray
C) Sievert
D) Curie/mass

Q445: The conductivity of a semiconductor increases with:

A) Increase in temperature
B) Decrease in temperature
C) Increase in pressure
D) Decrease in pressure

Q446: In an n-type semiconductor, the majority carriers are:

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

Q447: The SI unit of electric field intensity is:

A) N/C
B) V
C) C/N
D) J/C

Q448: The phenomenon of total internal reflection occurs when the angle of incidence is:

A) Greater than critical angle
B) Less than critical angle
C) Equal to 90 deg
D) Zero

Q449: The SI unit of magnetic flux is:

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

Q450: The law of conservation of angular momentum follows from conservation of:

A) Torque being zero
B) Energy
C) Force
D) Mass