Quiz: Physics set 4

Q151: A particle is projected with speed 20 m/s at an angle of 30 deg to the horizontal. The maximum height reached (g = 10 m/s2) is:

A) 5 m
B) 10 m
C) 15 m
D) 20 m

Q152: The time of flight of the projectile in the previous question is:

A) 1 s
B) 2 s
C) 3 s
D) 4 s

Q153: A body of mass 5 kg is moving with constant velocity. The net force acting on it is:

A) 0 N
B) 5 N
C) 10 N
D) Cannot be determined

Q154: A spring of spring constant 1000 N/m is stretched by 0.1 m. The elastic potential energy stored is:

A) 2.5 J
B) 5 J
C) 10 J
D) 20 J

Q155: For a body in circular motion with constant speed, which quantity changes continuously?

A) Velocity
B) Speed
C) Mass
D) Kinetic energy

Q156: The moment of inertia of a thin ring of mass M and radius R about its diameter is:

A) (1/2)MR2
B) MR2
C) (3/2)MR2
D) (1/4)MR2

Q157: If angular momentum of a body is conserved, which quantity must remain constant?

A) External torque
B) Angular velocity
C) Moment of inertia
D) External force

Q158: The acceleration due to gravity at a height h above Earth's surface (h << R) is approximately:

A) g(1-2h/R)
B) g(1+h/R)
C) g(1-h/R)
D) g(1+2h/R)

Q159: The excess pressure inside a soap bubble of radius r and surface tension T is:

A) 4T/r
B) 2T/r
C) T/r
D) 8T/r

Q160: The coefficient of volume expansion of an ideal gas is equal to:

A) 1/T
B) T
C) 0
D) 2/T

Q161: The work done in an adiabatic process is:

A) Greater than isothermal
B) Less than isothermal
C) Zero
D) Same as isothermal

Q162: In SHM, the velocity of the particle is maximum at:

A) Mean position
B) Extreme position
C) Half amplitude
D) Random position

Q163: The fundamental frequency of a stretched string fixed at both ends is:

A) v/2L
B) v/L
C) 2v/L
D) L/2v

Q164: The electric field lines originate from:

A) Positive charges
B) Negative charges
C) Both
D) Neutral bodies

Q165: The electric potential energy of a charge q in potential V is:

A) qV
B) V/q
C) q/V
D) V2

Q166: If three identical capacitors are connected in series, the equivalent capacitance is:

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

Q167: The drift velocity of electrons is directly proportional to:

A) Electric field
B) Resistance
C) Length
D) Temperature

Q168: The magnetic field inside a long solenoid is:

A) mu0nI
B) mu0I/2pir
C) mu0Ir
D) Zero

Q169: The SI unit of magnetic field is:

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

Q170: The back emf in a motor is maximum when:

A) Motor runs at full speed
B) Motor starts
C) Load is high
D) Current is maximum

Q171: In an AC circuit, the current leads the voltage by 90 deg in:

A) Capacitor
B) Inductor
C) Resistor
D) LCR circuit

Q172: The power dissipated in a resistor connected to AC source is:

A) VIcosphi
B) VI
C) V2
D) I2

Q173: The magnification produced by a concave mirror for object at infinity is:

A) Zero
B) One
C) Infinity
D) Negative unity

Q174: The refractive index of a medium is independent of:

A) Amplitude
B) Wavelength
C) Nature of medium
D) Temperature

Q175: In Young's double slit experiment, the fringe width increases if:

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

Q176: The photoelectric current depends on:

A) Intensity of light
B) Frequency only
C) Work function
D) Stopping potential

Q177: The Bohr radius is proportional to:

A) 1/Z
B) Z
C) 1/Z2
D) Z2

Q178: The binding energy of a nucleus is related to:

A) Mass defect
B) Atomic number
C) Neutron number
D) Radius

Q179: The half-life of a radioactive substance is independent of:

A) Temperature
B) Initial mass
C) Pressure
D) Chemical state

Q180: The energy gap of a semiconductor is of the order of:

A) 1 eV
B) 10 eV
C) 103 eV
D) 0 eV

Q181: In a p-n junction diode, the depletion region is formed due to:

A) Diffusion of charge carriers
B) Drift only
C) External field
D) Heating

Q182: The current gain of a transistor in common emitter configuration is:

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

Q183: The dimensional formula of electric charge is:

A) IT
B) I/T
C) MLT
D) MLT-2

Q184: The speed of a satellite in a circular orbit of radius r is:

A) sqrt(GM/r)
B) sqrt(2GM/r)
C) GM/r
D) 2GM/r

Q185: The phenomenon of beats occurs due to:

A) Superposition of waves of slightly different frequencies
B) Reflection
C) Refraction
D) Diffraction

Q186: Electric flux through a closed surface enclosing a charge q is:

A) q/epsilon0
B) epsilon0q
C) qepsilon0
D) Zero

Q187: The unit of inductance is:

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

Q188: At resonance in LCR circuit, impedance is equal to:

A) R
B) XL
C) XC
D) Zero

Q189: A convex lens produces a virtual image when the object is placed:

A) Between lens and focus
B) Beyond 2F
C) At focus
D) At infinity

Q190: The resolving power of a telescope depends on:

A) Diameter of objective
B) Focal length of eyepiece
C) Magnification
D) Intensity

Q191: The energy of nth orbit of hydrogen atom is proportional to:

A) 1/n2
B) n2
C) 1/n
D) n

Q192: Gamma rays are:

A) Electromagnetic waves
B) Charged particles
C) Neutrons
D) Sound waves

Q193: The activity of a radioactive sample is proportional to:

A) Number of undecayed nuclei
B) Half-life
C) Time
D) Energy released

Q194: The conductivity of a semiconductor increases when:

A) Temperature increases
B) Temperature decreases
C) Light removed
D) Voltage decreases

Q195: The logic gate used for addition of two binary digits is:

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

Q196: The SI unit of electric power is:

A) Watt
B) Joule
C) Volt
D) Ampere

Q197: The center of mass of an isolated system moves with:

A) Constant velocity
B) Increasing velocity
C) Zero velocity always
D) Random velocity

Q198: The unit of coefficient of friction is:

A) Dimensionless
B) N
C) m/s
D) kg

Q199: The phenomenon responsible for blue color of sky is:

A) Scattering
B) Reflection
C) Refraction
D) Interference

Q200: The speed of sound depends on:

A) Elasticity and density
B) Pressure only
C) Frequency only
D) Amplitude