

## Quiz: Physics set 10

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**Q451:** A particle starts from rest and moves with uniform acceleration. If it covers 20 m in the first 2 s, the acceleration is:

- A) 5 m/s<sup>2</sup>
- B) 10 m/s<sup>2</sup>
- C) 20 m/s<sup>2</sup>
- D) 2.5 m/s<sup>2</sup>

**Q452:** A body is projected vertically upward with speed 40 m/s. The time of flight ( $g = 10 \text{ m/s}^2$ ) is:

- A) 4 s
- B) 6 s
- C) 8 s
- D) 10 s

**Q453:** Two forces of magnitudes 3 N and 4 N act at right angles. The magnitude of the resultant is:

- A) 5 N
- B) 7 N
- C) 1 N
- D) 12 N

**Q454:** The work done by a force of 10 N in moving a body through 2 m in the direction of force is:

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

**Q455:** A disc and a ring of same mass and radius roll down an inclined plane. Which reaches the bottom first?

- A) Disc
- B) Ring
- C) Both together
- D) Depends on angle

**Q456:** The angular momentum of a body remains constant when:

- A) No external torque acts
- B) No force acts
- C) Speed is constant
- D) Mass is constant

**Q457:** The acceleration due to gravity at a depth  $d$  below Earth's surface is proportional to:

- A)  $(R - d)$
- B)  $1/(R - d)$
- C)  $R + d$
- D)  $1/(R + d)$

**Q458: The pressure at a depth  $h$  in a liquid of density  $\rho$  is given by:**

- A)  $\rho gh$
- B)  $\rho gh/h$
- C)  $gh/\rho$
- D)  $g/\rho h$

**Q459: The dimensional formula of bulk modulus is the same as that of:**

- A) Pressure
- B) Force
- C) Energy
- D) Density

**Q460: For an isothermal expansion of an ideal gas, the work done is:**

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

**Q461: The frequency of a simple pendulum depends on:**

- A) Length
- B) Mass of bob
- C) Amplitude
- D) Material of bob

**Q462: The speed of sound in air increases when:**

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

**Q463: The electric field at the center of a uniformly charged spherical shell is:**

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

**Q464: The SI unit of electric potential is:**

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

**Q465: If a dielectric slab is introduced between capacitor plates, the capacitance:**

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

**Q466: The drift velocity of electrons in a conductor is of the order of:**

- A)  $10^{-4}$  m/s
- B) 102 m/s
- C) 106 m/s
- D) 108 m/s

**Q467: The magnetic field at the center of a circular coil of radius R carrying current I is:**

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

**Q468: The force between two parallel current-carrying conductors is directly proportional to:**

- A) Product of currents
- B) Distance between them
- C) Resistance
- D) Length only

**Q469: The induced emf in a circuit is proportional to:**

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

**Q470: In an AC circuit, the power factor is maximum when the circuit is:**

- A) Purely resistive
- B) Purely inductive
- C) Purely capacitive
- D) LCR at high frequency

**Q471: The focal length of a plane mirror is:**

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

**Q472: The refractive index of a medium is equal to the ratio of:**

- A) Speed of light in vacuum to that in medium
- B) Wavelengths in vacuum and medium
- C) Frequencies in vacuum and medium
- D) Both A and B

**Q473: In Young's double slit experiment, the fringe width increases if:**

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

**Q474: The stopping potential in photoelectric effect depends on:**

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

**Q475: The de Broglie wavelength of a particle is inversely proportional to:**

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

**Q476: The radius of a nucleus varies with mass number A as:**

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

**Q477: The energy released in nuclear reactions is due to:**

- A) Mass defect
- B) Charge defect
- C) Volume defect
- D) Energy absorption

**Q478: The half-life of a radioactive substance is independent of:**

- A) Temperature
- B) Pressure
- C) Chemical state
- D) Initial amount

**Q479: The conductivity of a semiconductor increases with:**

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

**Q480: In an n-type semiconductor, the majority charge carriers are:**

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

**Q481: 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)  $\text{J}\cdot\text{s}$

**Q482: 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

**Q483: The SI unit of torque is:**

- A) N·m
- B) J
- C) W
- D) kg·m<sup>2</sup>

**Q484: The speed of sound in air is maximum when air is:**

- A) Hot
- B) Cold
- C) Dry
- D) At low pressure

**Q485: The electric potential at infinity due to a point charge is:**

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

**Q486: The magnetic field inside a toroid is:**

- A) Confined within core
- B) Zero everywhere
- C) Uniform outside
- D) Maximum outside

**Q487: An AC generator converts:**

- A) Mechanical energy into electrical energy
- B) Electrical into mechanical
- C) Thermal into electrical
- D) Chemical into electrical

**Q488: The power factor of a purely resistive AC circuit is:**

- A) 1
- B) 0
- C) 0.5
- D) Depends on frequency

**Q489: The magnification produced by a plane mirror is:**

- A) +1
- B) -1
- C) 0
- D) Depends on distance

**Q490: The resolving power of a telescope increases when:**

- A) Diameter of objective increases
- B) Wavelength increases
- C) Focal length decreases
- D) Intensity increases

**Q491: The work function of a metal depends on:**

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

**Q492: The energy of a photon is given by:**

- A)  $h\nu$
- B)  $hc$
- C)  $h/\lambda$
- D) Both A and C

**Q493: The decay constant of a radioactive element depends on:**

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

**Q494: The Fermi level in an intrinsic semiconductor lies:**

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

**Q495: The logic gate whose output is 0 only when all inputs are 1 is:**

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

**Q496: The SI unit of capacitance is named after:**

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

**Q497: The phenomenon responsible for mirage is:**

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

**Q498: The SI unit of electric current density is:**

- A) A/m<sup>2</sup>
- B) A/m
- C) C/m<sup>2</sup>
- D) V/m

**Q499: The magnetic susceptibility of a diamagnetic material is:**

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

**Q500: Faraday's law of electromagnetic induction states that induced emf is proportional to:**

- A) Rate of change of magnetic flux
- B) Magnetic field strength
- C) Area of coil
- D) Resistance of circuit