

Physics Model Question Paper 5: (For Class 11 and 12 and Pre-Medical/Engineering Entrance)

Question 1 : If γ is the ratio of specific heats and R is the universal gas constant, then the molar specific heat at constant volume C_v is given by

(A) γR

(B) $\frac{(\gamma - 1)}{\gamma}$

(C) $\frac{R}{\gamma - 1}$

(D) $\frac{\gamma R}{\gamma - 1}$

Answer : (C)

Question 2 : If μ_0 is permeability of free space and ϵ_0 is permittivity of free space, the speed of light in vacuum is given by

(A) $\sqrt{\mu_0 \epsilon_0}$

(B) $\sqrt{\frac{\mu_0}{\epsilon_0}}$

(C) $\sqrt{\frac{1}{\mu_0 \epsilon_0}}$

(D) $\sqrt{\frac{\epsilon_0}{\mu_0}}$

Answer : (C)

Question 3 : If an electron and a proton have the same de-Broglie wavelength, then the kinetic energy of the electron is

(A) zero

(B) less than that of a proton

(C) more than that of a proton

(D) equal to that of a proton

Answer : (C)

Question 4 : If the linear momentum of a body is increased by 50%, then the kinetic energy of that body increases by _____

(A) 225%

(B) 25%

(C) 100%

(D) 125%

Answer : (D)

Question 5 : In a Fraunhofer diffraction experiment at a single slit using a light of wavelength 400 nm, the first minimum is formed at an angle of 30° . The direction θ of the first secondary maximum is given by

(A) $\sin^{-1} \frac{2}{3}$

(B) $\sin^{-1} \frac{3}{4}$

(C) $\sin^{-1} \frac{1}{4}$

(D) $\tan^{-1} \frac{2}{3}$

Answer : (B)

Question 6 : In a given direction, the intensities of the scattered light by a scattering substance for two beams of light are in the ratio of 256 : 81. The ratio of the frequency of the first beam to the frequency of the second beam is _____.

(A) 64 : 27

(B) 2 : 1

(C) 64:127

(D) 1:2

Answer : (D)

Question 7 : In a series resonant R-L-C circuit, the voltage across R is 100 V and the value of R = 1000 Ω . The capacitance of the capacitor is 2×10^{-6} F; angular frequency of AC is 200 rad s^{-1} . Then the P.D. across the inductance coil is _____.

- (A) 250 V
- (B) 400 V
- (C) 100 V
- (D) 40 V

Answer : (A)

Question 8 : In an unbiased p-n junction

- (A) Potential at p is more than that at n
- (B) Potential at p is less than that at n
- (C) Potential at p is equal to that at n
- (D) Potential at p is +ve and that at n is -ve

Answer : (B)

Question 9 : In Young's double slit experiment, a third slit is made in between the double slits. Then

- (A) intensity of fringes totally disappears.
- (B) only bright light is observed on the screen.
- (C) fringes of unequal width are formed.
- (D) contrast between bright and dark fringes is reduced.

Answer : (D)

Question 10 : If a black body emits 0.5 joules of energy per second when it is at 27°C , then the amount of energy emitted by it when it is at 627°C will be

- (A) 40.5 J
- (B) 162 J
- (C) 13.5 J
- (D) 135 J

Answer : (A)