Physics Model Question Paper 9: (For Class 11 and 12 and Pre-Medical/Engineering Entrance)

Question 1 : Two protons are kept at a separation of 40 $\overset{0}{A}$. F_n is the nuclear force and F_e is the electrostatic force between them. Then

(A) $F_n \gg F_e$

(B) $F_n = F_e$

(C) $F_n \ll F_e$

(D) $F_n \gg F_e$

Answer : (C)

Question 2 : Two similar circular loops carry equal currents in the same direction. Un moving the coils further apart, the electric current will

(A) increase in both

(B) decrease in both

(C) remain unaltered

(D) increases in one and decreases in the second

Answer : (A)

Question 3 : Two simple harmonic motions are represented by y_1 = 5[Sin2pt + $\sqrt{3}$ Cos2pt] and y_2 = 5 sin $\left(2\pi t + \dfrac{\pi}{4}\right)$. The ratio of their amplitude is _____.

(A) 1 : 3

(B) $\sqrt{3}$: 1

(C) 1 : 1

(D) 2 : 1

Answer : (D)

Question 4 : Two slabs are of the thicknesses d_1 and d_2. Their thermal conductivities are K_1 and K_2 respectively. They are in series. The free ends of the combination of these two slabs are kept at temperatures q_1 and q_2. Assume $q_1 > q_2$. The temperature q of their common junction is _____.

(A) $\dfrac{K_1\theta_1 d_2 + K_2\theta_2 d_1}{K_1 d_2 + K_2 d_1}$

(B) $\dfrac{K_1\theta_1 + K_2\theta_2}{K_1 + K_2}$

(C) $\dfrac{K_1\theta_1 + K_2\theta_2}{\theta_1 + \theta_2}$

(D) $\dfrac{K_1\theta_1 d_1 + K_2\theta_2 d_2}{K_1 d_2 + K_2 d_1}$

Answer : (A)

Question 5 : Two tangent galvanometers A and B are identical except in their number of turns. They are connected in series. On passing a current through them, deflections of 600 and 300 are produced. The ratio of the number of turns in A and B is

(A) 1 : 3

(B) 3 : 1

(C) 1 : 2

(D) 2 : 1

Answer : (B)

Question 6 : Water is in streamline flow along a horizontal pipe with nonuniform cross-section. At a point in the pipe where the area of cross-section is 10 cm^2, the velocity of water is 1 ms^{-1} and the pressure is 2000 Pa. The pressure at another point where the cross-sectional area is 5 cm^2 is _____.

(A) 1000 Pa

(B) 500 Pa

(C) 4000 Pa

(D) 2000 Pa

Answer : (B)

Question 7 : What is the minimum thickness of a thin film required for constructive interference in the reflected light from it?

Given, the refractive index of the film = 1.5, wavelength of the light incident on the film = 600 nm.

(A) 50 nm

(B) 200 nm

(C) 100 nm

(D) 300 nm

Answer : (C)

Question 8 : When a neutron is disintegrated to give a b-particle, _____.

(A) a proton alone is emitted.

(B) a proton and an antineutrino are emitted.

(C) a neutrino alone is emitted.

(D) a proton and neutrino are emitted.

Answer : (B)

Question 9 : When a piece of metal is illuminated by a monochromatic light of wavelengthl, then stopping potential is 3Vs. When same surface is illuminated by light of wavelength 2l, then stopping potential becomes. Vs. The value of threshold wavelength for photoelectric emission will be

(A) 4l

(B) 8l

(C) $\frac{4}{3}\lambda$

(D) 6l

Answer : (A)

Question 10 : Which of the following is a dichroic crystal?

(A) Quartz

(B) Tourmaline

(C) Mica

(D) Selenite

Answer : (B)