MHT CET 2025 Apr 9 Shift 1 Question Paper

Time Allowed :3 Hour	Maximum Marks :200	Total Questions :200

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 3 hours duration.
2. The question paper consists of 200 questions. The maximum marks are 200.
3. There are three parts in the question paper consisting of Physics, Chemistry and Biology (Botany and Zoology) having 50 questions in each part of equal weightage.

1. A wire of length L having Resistance R falls from a height h in Earth's horizontal magnetic field. What is the current through the wire?

(1) $\frac{hB}{R}$

(2) $\frac{hB^2}{R}$

(3) $\frac{hB^2}{2R}$

(4) $\frac{hB}{2R}$

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2. Mass = (28 ± 0.01) **g, Volume =** (5 ± 0.1) **cm^3. What is the percentage error in density?**

(1) $\frac{2.25}{28}\%$

(2) $\frac{3.57}{28}\%$

(3) $\frac{1.25}{28}\%$

(4) $\frac{4.5}{28}\%$

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3. The value of g at height h above Earth's surface is $\frac{g}{\sqrt{3}}$. Find h in terms of the radius of the Earth.

(1) R

(2) $2R$

(3) $R\sqrt{3}$

(4) $\frac{R}{\sqrt{3}}$

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4. Given the voltage equation $V = 100\sqrt{2}\sin(\omega t)$ and capacitance $C = 2\,\mu$F, calculate the RMS current.

(1) $10\,\text{A}$

(2) $20\,\text{A}$

(3) $50\,\text{A}$

(4) $100\,\text{A}$

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5. The equation for the RMS velocity is given as

$$v_{\text{rms}} = \sqrt{\frac{3RT}{M_0}}$$

where R is the gas constant, T is the temperature, and M_0 is the molecular mass. If the temperature is increased, find the new RMS velocity v_{rms} when the temperature is doubled.

(1) $\sqrt{3}v_{\text{rms}}$

(2) $2v_{\text{rms}}$

(3) $\sqrt{2}v_{\text{rms}}$

(4) $\frac{v_{\text{rms}}}{\sqrt{2}}$

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6. Two spherical black bodies radiate the same amount of heat per second. If their temperatures are T_1 and T_2, and their radii are R_1 and R_2, respectively, find the relation between their temperatures and radii.

(1) $T_1 = \sqrt{2}T_2$

(2) $T_1 = 2T_2$

(3) $T_1 = \frac{T_2}{\sqrt{2}}$

(4) $T_1 = \sqrt{3}T_2$

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7. Energy stored in a capacitor is given by the equation

$$E = \frac{1}{2}CV^2$$

where: - C is the capacitance, - V is the voltage, - E is the energy stored. Given the values of

C, V, and E, determine the energy stored.

(1) $E = \frac{1}{2}CV^2$

(2) $E = CV$

(3) $E = CV^3$

(4) $E = \frac{1}{2}CV$

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8. What is the ratio of the wavelength of the Lyman series limit to the Paschen series limit?

(1) $1 : 4$

(2) $1 : 3$

(3) $2 : 3$

(4) $1 : 2$

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9. What is the ratio of the wavelength of a photon?

(1) $\lambda = \frac{h}{mv}$

(2) $\lambda = \frac{c}{f}$

(3) $\lambda = \frac{E}{h}$

(4) $\lambda = \frac{h}{E}$
