MHT CET 2026 April 17 Shift 1

Question Paper

Conducted by CET Cell, Maharashtra

General Instructions

(i) **Duration:** The total duration of the examination is 3 hours (180 minutes).

(ii) **Total Marks:** The complete paper carries a maximum of 200 marks.

(iii) **Structure:** The paper has 3 Sections:

- **Section A:** 50 Multiple Choice Questions (Physics).
- **Section B:** 50 Multiple Choice Questions (Chemistry).
- **Section B:** 50 Multiple Choice Questions (Mathematics).

(iv) **Compulsory Questions:** All 150 questions are compulsory.

(v) Each question has four options. Only **one** option is correct.

(vi) **Correct Answer:** +1 marks.

(vii) **Incorrect Answer:** (No Negative marking).

(viii) **Unanswered/Marked for Review:** 0 marks.

Mathematics

1. The value of $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x}\, dx$ **is:**

(A) $\frac{\pi}{2}$

(B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$

(D) $\frac{\pi}{6}$

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2. If $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$, find the magnitude of $\vec{a} \times \vec{b}$.

(A) $\sqrt{75}$

(B) $\sqrt{86}$

(C) $\sqrt{110}$

(D) $\sqrt{102}$

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3. Find the truth value of the statement: "If 2 is even, then 5 is prime."

(A) True

(B) False

(C) Cannot be determined

(D) None of these

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4. Find the general solution of the differential equation $\frac{dy}{dx} + y = e^{-x}$.

(A) $y = e^{-x}(x + C)$

(B) $y = xe^{-x} + C$

(C) $y = e^{x}(x + C)$

(D) $y = e^{-x} + C$

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5. Determine the distance of the point $(1, 2, 3)$ from the plane $2x + 3y - z = 7$.

(A) $\frac{2}{\sqrt{14}}$

(B) $\frac{4}{\sqrt{14}}$

(C) $\frac{1}{\sqrt{14}}$

(D) $\frac{3}{\sqrt{14}}$

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6. Calculate the moment of inertia of a uniform circular disc of mass M and radius R about its diameter.

(A) $\frac{1}{2}MR^2$

(B) $\frac{1}{4}MR^2$

(C) MR^2

(D) $\frac{3}{2}MR^2$

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7. A wire of resistance R is stretched to triple its original length. Find the new resistance.

(A) $3R$

(B) $6R$

(C) $9R$

(D) R

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8. Find the energy of a photon with a wavelength of $4000\,\text{Å}$. (Take $h = 6.63 \times 10^{-34}\,\text{Js}$, $c = 3 \times 10^8\,\text{m/s}$).

(A) $4.97 \times 10^{-19}\,\text{J}$

(B) $3.31 \times 10^{-19}\,\text{J}$

(C) $6.63 \times 10^{-19}\,\text{J}$

(D) $2.48 \times 10^{-19}\,\text{J}$

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9. Determine the centripetal force acting on a $1000\,\text{kg}$ car moving at $20\,\text{m/s}$ around a curve of radius $50\,\text{m}$.

(A) 4000 N

(B) 8000 N

(C) 10000 N

(D) 20000 N

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10. What is the change in internal energy of a system if 500 J of heat is added and 200 J of work is done by the system?

(A) 300 J

(B) 700 J

(C) 200 J

(D) 500 J

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11. What is the oxidation number of Manganese (Mn) in the compound $KMnO_4$?

(A) +4

(B) +6

(C) +7

(D) +2

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12. Identify the product formed when Ethyl alcohol is heated with concentrated H_2SO_4 at 443 K.

(A) Ethane

(B) Ethene

(C) Diethyl ether

(D) Acetaldehyde

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13. Which reagent is used in the Reimer–Tiemann reaction to convert phenol to salicylaldehyde?

(A) $CHCl_3$ and $NaOH$

(B) HNO_3

(C) $KMnO_4$

(D) HCl

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14. Calculate the pH of a $0.001\,M$ $NaOH$ **solution at** $298\,K$**.**

(A) 11

(B) 10

(C) 3

(D) 7

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15. Identify the type of crystal defect found in $NaCl$ **crystals.**

(A) Frenkel defect

(B) Schottky defect

(C) Metal excess defect

(D) Interstitial defect
