MHT CET 2026 May 13 Shift 2

Question Paper (Memory-Based)

Conducted by Maharashtra State CET Cell

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 C:** 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) **Right Answer:** +1 marks for Physics and Chemistry Questions. +2 marks for Mathematics Questions.

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

1. If $I = \int \frac{\sin x + \sin^3 x}{\cos 2x}\, dx = P\cos x + Q\log\left|\frac{\sqrt{2}\cos x - 1}{\sqrt{2}\cos x + 1}\right| + C$, **then the values of** P **and** Q **are respectively:**

(A) $\frac{1}{2}, \frac{3}{4\sqrt{2}}$

(B) $\frac{1}{2}, \frac{-3}{4\sqrt{2}}$

(C) $\frac{1}{2}, \frac{3}{2\sqrt{2}}$

(D) $\frac{1}{2}, \frac{-3}{2\sqrt{2}}$

2. In a triangle $\triangle ABC$, if a, b, and c are in arithmetic progression, then $\cos A + 2\cos B + \cos C =$

(A) 1

(B) 2

(C) $\frac{3}{2}$

(D) $\sqrt{3}+1$

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3. If the area of triangle ABC is $b^2-(c-a)^2$, then $\tan B =$

(A) 1

(B) $\frac{13}{15}$

(C) $\frac{1}{4}$

(D) $\frac{8}{15}$

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4. In a $\triangle ABC$, $a=1$, $b=\sqrt{3}$ and $\angle C = \frac{\pi}{6}$. Then the measure of the third side $c =$

(A) 4

(B) 3

(C) 1

(D) 2

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5. The integral $\int \frac{1}{\sqrt[4]{(x-1)^3(x+2)^5}}\,dx$ is equal to: (where C is a constant of integration)

(A) $\frac{3}{4}\left(\frac{x+2}{x-1}\right)^{1/4}+C$

(B) $\frac{3}{4}\left(\frac{x+2}{x-1}\right)^{5/4}+C$

(C) $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4}+C$

(D) $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{5/4}+C$

6. Calculate the pH of 0.02 M monobasic acid having 2% dissociation.

(A) 3.4

(B) 4.5

(C) 5.1

(D) 5.8

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7. What is the pH of 2×10^{-3} M solution of monoacidic weak base if it ionises to the extent of 5%?

(A) 14

(B) 6

(C) 4

(D) 2

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8. Identify base$_2$ for the following equation according to Brønsted–Lowry theory:

$$HCl_{(aq)} + H_2O_{(l)} \rightleftharpoons H_3O^+_{(aq)} + Cl^-_{(aq)}$$

(A) $H_3O^+_{(aq)}$

(B) $H_2O_{(l)}$

(C) $Cl^-_{(aq)}$

(D) $HCl_{(aq)}$

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9. Calculate the pH of 0.01 M sulphuric acid.

(A) 1.699

(B) 2.00

(C) 0.699

(D) 3.398

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10. What is the pH of a weak dibasic acid that is 2% dissociated in its M/100 solution at 298 K?

(A) 1.6990

(B) 2.3979

(C) 3.3970

(D) 4.6990

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11. An open pipe resonates with a tuning fork of frequency 500 Hz. It is observed that two successive nodes are separated by 34 cm. The velocity of sound in air is:

(A) 330 m/s

(B) 340 m/s

(C) 350 m/s

(D) 360 m/s

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12. A train moving at 20 m/s approaches a stationary observer. The frequency of the whistle emitted by the train is 640 Hz. If the velocity of sound is 340 m/s, the apparent frequency heard by the observer is:

(A) 680 Hz

(B) 600 Hz

(C) 720 Hz

(D) 640 Hz

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13. Unpolarized light of intensity I_0 is incident on two polaroids placed coaxially. The transmission axis of the second polaroid is at an angle of 60° to the first. The intensity of emerging light is:

(A) $I_0/2$

(B) $I_0/4$

(C) $I_0/8$

(D) $3I_0/8$

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14. A parallel plate capacitor has capacitance C. If a dielectric slab of dielectric constant K and thickness equal to half the plate separation is introduced parallel to the plates, the new capacitance is:

(A) $\dfrac{2K}{K+1}C$

(B) $\dfrac{K+1}{2K}C$

(C) $\dfrac{K}{K+1}C$

(D) KC

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15. An infinite line charge of uniform linear charge density λ is placed along the z-axis. The work done in moving a charge q from $(a, 0, 0)$ to $(2a, 0, 0)$ is:

(A) $\dfrac{q\lambda}{2\pi\varepsilon_0}\ln 2$

(B) $\dfrac{q\lambda}{4\pi\varepsilon_0}\ln 2$

(C) $\dfrac{q\lambda}{2\pi\varepsilon_0}\ln\left(\frac{1}{2}\right)$

(D) zero
