

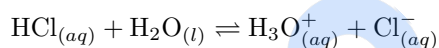
MHT CET 2026 Mathematics Memory Based Question Paper PDF

Mathematics

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) $\sqrt{3} + 1$
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) $\frac{8}{15}$
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
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) $\frac{4}{3} \left(\frac{x-1}{x+2} \right)^{5/4} + C$

Chemistry

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
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
8. Identify base₂ for the following equation according to Brønsted–Lowry theory:



- (a) $\text{H}_3\text{O}^+_{(aq)}$
(b) $\text{H}_2\text{O}_{(l)}$
(c) $\text{Cl}^-_{(aq)}$
(d) $\text{HCl}_{(aq)}$
9. Calculate the pH of 0.01 M sulphuric acid.
- (a) 1.699
(b) 2.00
(c) 0.699
(d) 3.398
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

Physics

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
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
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) $3I_0/8$
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) $\frac{2K}{K+1}C$
 - (b) $\frac{K+1}{2K}C$
 - (c) $\frac{K}{K+1}C$
 - (d) KC
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) $\frac{q\lambda}{2\pi\epsilon_0} \ln 2$
 - (b) $\frac{q\lambda}{4\pi\epsilon_0} \ln 2$
 - (c) $\frac{q\lambda}{2\pi\epsilon_0} \ln \left(\frac{1}{2}\right)$
 - (d) zero