

MHT CET 2026 Mathematics Memory Based Question Paper PDF

Mathematics

1. In a certain culture of bacteria, the rate of increase is proportional to the number of bacteria present at that instant. It is found that there are 10,000 bacteria at the end of 3 hours and 40,000 bacteria at the end of 5 hours, then the number of bacteria present in the beginning are:

- (A) 1250
(B) 1200
(C) 1350
(D) 1300

2. The value of

$$\int \frac{x^2 - 1}{x^3 \sqrt{2x^4 - 2x^2 + 1}} dx$$

is:

- (A) $\sqrt{2 - \frac{2}{x^2} + \frac{1}{x^4}} + C$
(B) $2\sqrt{2 - \frac{2}{x^2} + \frac{1}{x^4}} + C$
(C) $\frac{1}{2}\sqrt{2 - \frac{2}{x^2} + \frac{1}{x^4}} + C$
(D) $\frac{1}{4}\sqrt{2 - \frac{2}{x^2} + \frac{1}{x^4}} + C$

3. The area bounded by the X-axis and the curve

$$y = x(x - 2)(x + 1)$$

is:

- (A) $\frac{37}{12}$ sq. units
(B) $\frac{27}{12}$ sq. units
(C) $\frac{37}{4}$ sq. units
(D) $\frac{27}{13}$ sq. units

- 4.

$$\int \frac{1}{x^{1/2} + x^{1/3}} dx$$

is equal to:

- (A) $\sqrt{x} - \sqrt[3]{x} + \sqrt[6]{x} - \log |x^{1/6} + 1| + C$
(B) $2\sqrt{x} - 3\sqrt[3]{x} + 6\sqrt[6]{x} - 6\log |x^{1/6} + 1| + C$
(C) $2\sqrt{x} + 3\sqrt[3]{x} + 6\sqrt[6]{x} + 6\log |x^{1/6} + 1| + C$
(D) $\sqrt{x} + \sqrt[3]{x} + \sqrt[6]{x} + \log |x^{1/6} + 1| + C$

5. A wire 64 m long is bent into the shape of a rectangle. What should be its dimensions so that the enclosed area is maximum?

(A) 16 m, 16 m
(B) 18 m, 18 m
(C) 24 m, 24 m
(D) 36 m, 36 m

6.

$$\lim_{x \rightarrow 2} \left(\frac{1}{x-2} - \frac{2}{x^3 - 3x^2 + 2x} \right) =$$

(A) $\frac{2}{3}$
(B) $-\frac{2}{3}$
(C) $\frac{3}{2}$
(D) $-\frac{3}{2}$

7. If slope of two lines represented by $\frac{x^2}{a} + \frac{2xy}{h} + \frac{y^2}{b} = 0$ is twice the other, then $ab : h^2 = ?$

(A) 1 : 2
(B) 2 : 1
(C) 8 : 9
(D) 9 : 8

8. If A is a 3×3 matrix satisfying $2A = 3A^2 + kI$, and $\det(A) = 1$, then the value of k is:

(A) -1
(B) 1
(C) $-\frac{1}{3}$
(D) $\frac{1}{3}$

9. If the area enclosed between the circle $x^2 + y^2 = 25$ and the parabola $y^2 = 16x$ is A , then $A = ?$

(A) $25\pi - 96$
(B) $50\pi - 96$
(C) $25\pi - 48$
(D) $50\pi - 48$

10. If $\vec{a} = 2\hat{i} - \hat{j} + 3\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - \hat{k}$, then the vector perpendicular to both $\vec{a}$ and $\vec{b}$ is:

(A) $-5\hat{i} + 5\hat{j} + 5\hat{k}$
(B) $-5\hat{i} + 5\hat{j} - 5\hat{k}$
(C) $5\hat{i} + 5\hat{j} + 5\hat{k}$
(D) $-5\hat{i} - 5\hat{j} + 5\hat{k}$