



# JEE (MAIN) 2026

## MEMORY BASED QUESTIONS & TEXT SOLUTION

**SHIFT-1**

**DATE & DAY:** 23 January 2026 & Friday

**PAPER-1**

**Duration:** 3 Hrs.  
**Time:** 09:00 – 12:00 IST

**SUBJECT: MATHEMATICS**

Selections in JEE (Advanced)/  
IIT-JEE Since 2002

**52979**

Classroom: 35901 | Distance: 17078

Selections in JEE (Main)/  
AIEEE Since 2009

**262693**

Classroom: 194471 | Distance: 68222

Selections in NEET (UG)/  
AIPMT/AIIMS Since 2012

**22733**

Classroom: 15409 | Distance: 7324

**Admission Open for 2026-27**

**Target:** JEE (Advanced) | JEE (Main) | NEET (UG) | PCCP (Class V to X)

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& JEE (Main) 2026 %ile / AIR

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## MATHEMATICS

1. A rectangle is formed by lines  $x = 0, y = 0, x = 3, y = 4$ . A line perpendicular to  $3x + 4y + 6 = 0$  divides the rectangle into two equal parts, then the distance of the line from  $(-1, \frac{3}{2})$  is

(1) 12

(2)  $\frac{17}{10}$ (3)  $\frac{6}{5}$ (4)  $4\frac{8}{5}$ 

Ans. (2)

2. Let  $A = \{-2, -1, 0, 1, 2, 3, 4\}$  and  $R$  be a relation  $R$ , such that  $R = \{(x, y) : (2x + y) \leq -2, x \in A, y \in A\}$ .

Let

 $l$  = number of elements in  $R$  $m$  = minimum number of elements to be added in  $R$  to make it reflexive. $n$  = minimum number of elements to be added in  $R$  to make it symmetric, then  $(l + m + n)$  is

(1) 10

(2) 17

(3) 11

(4) 14

Ans. (2)

3. Number of 4 letters words with or without meaning formed from the letters of the word PQRSTUUVV is

(1) 1232

(2) 1400

(3) 1422

(4) 1162

Ans. (3)

4. Find the value of  $\frac{\binom{100}{50}}{51} + \frac{\binom{100}{51}}{52} + \dots + \frac{\binom{100}{100}}{101}$

(1)  $\frac{2^{100}}{100}$ (2)  $\frac{2^{101}}{101}$ (3)  $\frac{2^{100}}{101}$ (4)  $\frac{2^{101}}{100}$ 

Ans. (3)

5. For given vectors  $\vec{a} = -\hat{i} + \hat{j} + 2\hat{k}$  and  $\vec{b} = 2\hat{i} - \hat{j} + \hat{k}$  where  $\vec{c} = \vec{a} \times \vec{b}$  and  $\vec{d} = \vec{c} \times \vec{b}$ . Then the value of  $(\vec{a} - \vec{b}) \cdot \vec{d}$  is

(1) -35

(2) 53

(3) -52

(4) 25

Ans. (1)

6. The line  $y = x + 1$  intersects the ellipse  $\frac{x^2}{2} + \frac{y^2}{1} = 1$  at  $A$  and  $B$ . Find the angle subtended by segment  $AB$  and centre of ellipse is:

(1)  $\frac{\pi}{2} + \tan^{-1}\left(\frac{1}{4}\right)$ (2)  $\frac{\pi}{2} - \tan^{-1}\left(\frac{1}{4}\right)$ (3)  $\frac{\pi}{2} + 2\tan^{-1}\left(\frac{1}{4}\right)$ (4)  $\frac{\pi}{4} + \tan^{-1}\left(\frac{1}{4}\right)$ 

Ans. (1)

7. Find  $\int_{\frac{\pi}{24}}^{\frac{5\pi}{24}} \frac{dx}{1 + (\tan 2x)^{1/3}}$

(1)  $\frac{\pi}{24}$ (2)  $\frac{\pi}{12}$ (3)  $\frac{\pi}{6}$ (4)  $\frac{\pi}{48}$ 

Ans. (2)

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8. Domain of  $f(x) = \log_5 \log_7 \log_2(7x - x^2 - 10)$ , is  $(m, n)$ . If  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$  is a hyperbola whose eccentricity is  $\frac{n}{3}$  and length of latus rectum is  $\frac{8m}{3}$ . then  $b^2 - a^2 = ?$

Ans. (-5.88)

9. The number of solutions of  $3\cos 2\theta + 8\cos \theta + 5 = 0$  if  $\theta \in [-3\pi, 2\pi]$  is:

(1) 8 (2) 3 (3) 0 (4) 5

Ans. (1)

10. For the differential equation  $x^4 dy + (4x^3 y + \sin x) dx = 0$  it is given that  $y\left(\frac{\pi}{2}\right) = 0$ . Then the value of  $\pi^4 y\left(\frac{\pi}{3}\right)$  is equal to

(1)  $\frac{9}{2}$  (2)  $\frac{81}{2}$  (3)  $\frac{27}{2}$  (4)  $\frac{243}{2}$

Ans. (2)

11. The area (in square units) bounded by the curve  $f(x) = \text{Max}\{\sin x, \cos x\}$  and  $x$ -axis between  $x = 0$  and  $x = \frac{3\pi}{2}$  is  $A$ . Then, the value of  $A + A^2$  is

Ans. (12)

12. If coefficients of  $x, x^2$  and  $x^3$  are in arithmetic progression of the binomial expansion of  $(1 + x^2)^2(1 + x)^n, n \in N$ . Then sum of all values of  $n$  is:

(1) 9 (2) 7 (3) 8 (4) 10

Ans. (1)

13. The mean and variance of the 8 observations  $-10, -7, -1, x, y, 16, 2, 9$  are  $\frac{7}{2}$  and  $\frac{293}{4}$  respectively. Then, the mean of  $x, y, x + y + 1, |x - y|$  is:

Ans. (11)

14. Let  $f(x) = \int \frac{e^x(2-x^2)}{\sqrt{1+x}(1-x)^2} dx$ , with  $f(0) = 0$ , then  $f\left(\frac{1}{2}\right)$  is

(1)  $\sqrt{2e} + 1$  (2)  $\sqrt{2e} - 1$  (3)  $\sqrt{3e} + 1$  (4)  $\sqrt{3e} - 1$

Ans. (4)

15. If  $A$  is matrix of order 3 and  $x = |3\text{adj}(A^2) \cdot \text{adj}(2A)|$  and  $|A| = 6$  and  $x = 2^n \cdot 3^m$ , then  $m + n$  is

(1) 21 (2) 25 (3) 27 (4) 19

Ans. (1)

16. If point  $B$  and  $C$  lies on line  $\frac{x}{1} = \frac{1-y}{-2} = \frac{z-2}{3}$  and point  $A$  is  $(1, 6, 3)$ . If  $BC = 10$ . Then, the area of  $\triangle ABC$  is:

(1)  $2\sqrt{13}$  (2)  $5\sqrt{13}$  (3)  $6\sqrt{13}$  (4)  $4\sqrt{13}$

Ans. (2)

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