



# JEE (MAIN) 2026

## MEMORY BASED QUESTIONS & TEXT SOLUTION

**SHIFT-1**

**DATE & DAY:** 24 January 2026 & Saturday

**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. The value of  $\frac{\sqrt{3}\cosec 20^\circ - \sec 20^\circ}{\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ}$  is  
 (1) 12      (2) 16      (3) 64      (4) 32  
**Ans.** (3)

2. The number of solution for  $x \in \mathbb{R}, x|x-4| + |x-1| - 2 = 0$   
 (1) 1      (2) 2      (3) 3      (4) 4  
**Ans.** (1)

3. If  $\cot x = \frac{5}{12}$  for some  $x \in \left(\pi, \frac{3\pi}{2}\right)$  then  $\sin 7x \left(\cos \frac{13x}{2} + \sin \frac{13x}{2}\right) + \cos 7x \left(\cos \frac{13x}{2} - \sin \frac{13x}{2}\right)$  is equal to  
**Ans.**  $\left(\frac{1}{\sqrt{13}}\right)$

4. Consider 10 data such that their mean is 10 and variance is 2. If one of the data  $\alpha$  is removed and new data entry  $\beta$  is inserted. Now new mean is 10.1 and new variance is 1.99 then  $(\alpha + \beta)$  is equal to  
 (1) 10      (2) 20      (3) 1      (4) 2  
**Ans.** (2)

5. Consider an A.P  $a_1, a_2, \dots, a_n; a_1 > 0, a_2 - a_1 = -\frac{3}{4}, a_n = \frac{1}{4}a_1$  and  $\sum_{i=1}^n a_i = \frac{525}{2}$  then  $\sum_{i=1}^{17} a_i$  is equal to  
 (1) 276      (2) 238      (3) 189      (4) 258  
**Ans.** (2)

6. If  $F(t) = \int \frac{1-\sin(\ln t)}{1-\cos(\ln t)} dt$  and  $F(e^{\pi/2}) = -e^{\pi/2}$  then  $F(e^{\pi/4})$  is  
 (1)  $(-1 - \sqrt{2})e^{\frac{\pi}{4}}$       (2)  $(1 - \sqrt{2})e^{\frac{\pi}{4}}$       (3)  $(1 + \sqrt{2})e^{\frac{\pi}{4}}$       (4)  $(-2 - \sqrt{2})e^{\frac{\pi}{4}}$   
**Ans.** (1)

7. Consider a sequence 729, 81, 9, 1, \_\_\_\_  
 Let  $P_n$  = product of first  $n$  terms of the given sequence and  $\sum_{n=1}^{40} (P_n)^{\frac{1}{n}} = \frac{3^\alpha - 1}{2 \times 3^\beta}$ . Then the value of  $\alpha + \beta$  is  
 (1) 73      (2) 75      (3) 76      (4) 81  
**Ans.** (1)

8. Number of matrices  $A$  of order  $3 \times 2$  such that all of its elements are from the set  $\{-2, -1, 0, 1, 2\}$  such that trace of  $AA^T$  is 5, is equal to  
 (1) 120      (2) 312      (3) 192      (4) 126  
**Ans.** (2)

9. Let a circle passes through points  $A(-\sqrt{2}\alpha, 0), B(0, \sqrt{3}\beta)$  and  $O(0, 0)$  such that its radius is 4. Then the radius of locus of centroid of triangle  $OAB$  is  
 (1)  $\frac{2}{3}$       (2)  $\frac{8}{3}$       (3)  $\frac{4}{3}$       (4)  $\frac{11}{3}$   
**Ans.** (2)

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10. A line passing through point  $P(1,1,1)$ , which is perpendicular to  $\frac{x-17}{1} = \frac{y-71}{1} = \frac{z}{0}$  and  $\frac{x-4}{4} = \frac{y-1}{1} = \frac{z-1}{1}$ . Let the line intersect the  $y - z$  plane at point  $Q$ . Another line parallel to  $L$  and passing through  $s(1,0,-1)$  intersect another plane at point  $R$ . Then the square of area of parallelogram  $PQRS$  is

(1) 11

(2) 12

(3) 6

(4) 8

**Ans. (3)**

11. Let  $\left| \frac{z-6i}{z-2i} \right| = 1$ ,  $\left| \frac{z-8+2i}{z+2i} \right| = \frac{3}{5}$  then if  $\omega$  satisfy both equation then find  $\sum |\omega^2|$ .

(1) 398

(2) 385

(3) 413

(4) 433

**Ans. (2)**

12. If  $S = \frac{1}{25!} + \frac{1}{23!3!} + \frac{1}{21!5!} + \dots$  upto 13 terms. Then  $13S = \frac{2^\alpha}{\beta!}$ , then  $\alpha + \beta$  is

**Ans. (49)**

13. Let  $A_1$  be the area enclosed by  $y = x^2 + 2$ ,  $y$ -axis and  $x + y = 8$  and

Let  $A_2$  be the area enclosed by  $y = x^2 + 2$ ,  $y^2 = x$ ,  $x = 2$  and  $y$ -axis, then the value of  $A_1 - A_2$  is

 (1)  $\frac{4+8\sqrt{2}}{3}$ 

 (2)  $\frac{2+4\sqrt{2}}{3}$ 

 (3)  $\frac{8+2\sqrt{2}}{3}$ 

 (4)  $\frac{8-2\sqrt{2}}{3}$ 
**Ans. (2)**

14. If  $f(x) = \frac{e^x(\tan x - x) + \ln(\sec x + \tan x) - x}{\tan x - x}$ ,  $x \neq 0$ . If  $f(x)$  is continuous at  $x = 0$ , then  $f(0)$  is equal to

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

(2) 1

 (3)  $\frac{1}{2}$ 

(4) 2

**Ans. (1)**

15.  $E_1: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

 $E_2: \frac{x^2}{A^2} + \frac{y^2}{B^2} = 1$ 

Let eccentricity of both  $E_1$  &  $E_2$  be  $\frac{4}{5}$ ,  $2l_1^2 = 9l_2$  where  $l_1$  and  $l_2$  are the length of latus rectum of  $E_1$  &  $E_2$  respectively. Distance between the foci of  $E_1$  be 8 then distance between foci of ellipse  $E_2$  is

 (1)  $\frac{32}{5}$ 

 (2)  $\frac{16}{5}$ 

 (3)  $\frac{8}{5}$ 

 (4)  $\frac{4}{5}$ 
**Ans. (1)**

16. Out of 100 bulbs, 10 are defective and 90 are non-defective. If the probability of finding 7 defective bulbs out of 8 draws, with replacement, is  $\frac{K}{10^8}$ , then the value of  $K$  is

(1) 69

(2) 72

(3) 75

(4) 96

**Ans. (2)**

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