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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)

100% Scholarship on the basis of Class 10th, 12th
& JEE (Main) 2026 %ile / AIR

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MATHEMATICS

1. The value of $\frac{\sqrt{3}\operatorname{cosec}20^\circ - \sec 20^\circ}{\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ}$ is
(1) 12 (2) 16 (3) 64 (4) 32
Ans. (3)
2. The number of solution for $x \in R, x|x-4| + |x-1| - 2 = 0$
(1) 1 (2) 2 (3) 3 (4) 4
Ans. (1)
3. If $\cot x = \frac{5}{12}$ for some $x \in (\pi, \frac{3\pi}{2})$ 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 α is removed and new data entry β 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 3×2 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 ω satisfy both equation then find $\sum |\omega^2|$.

(1) 398 (2) 385 (3) 413 (4) 433

Ans. (2)

12. If $S = \frac{1}{25!} + \frac{1}{23!} + \frac{1}{21!} + \dots$ 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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