

**JEE-Main-06-04-2024 (Memory Based)**  
**[EVENING SHIFT]**

**Maths**

**Question:** If the words with or without meaning made using all the letters of the word 'NAGPUR' are arranged in dictionary order. Then the word 315th position

**Options:**

- (a) NRAPUG
- (b) NRAGUP
- (c) NRAGPU
- (d) NRAPGU

**Answer: (d)**

**Question:**  ${}^{n+1}C_{r+1} : {}^nC_r : {}^{n-1}C_{r-1} = 55 : 35 : 21$  then  $2n + 5r$  is equal to

**Options:**

- (a) 60
- (b) 55
- (c) 62
- (d) 50

**Answer: (d)**

**Question:** There are letters to be delivered to 5 different location, then find the probability that letter is delivered to exactly 2 correct assuming each letter is delivered to unique address.

**Options:**

- (a)  $18/25$
- (b)  $12/25$
- (c)  $6/25$
- (d)  $4/25$

**Answer: (c)**

**Question:**  $f(x) = \frac{1}{7 - \sin 5x}$  be a function defined on R.

Then the range of the function f(x) is equal to:

**Options:**

- (a)  $\left[ \frac{1}{7}, 1 \frac{1}{6} \right]$
- (b)  $\left[ \frac{1}{8}, \frac{1}{6} \right]$
- (c)  $\left[ \frac{1}{8}, \frac{1}{5} \right]$
- (d)  $\left[ \frac{1}{7}, \frac{1}{5} \right]$

**Answer: (b)**

**Question:** If  $\int_0^{\frac{\pi}{2}} \frac{dx}{a^2 \sin^2 x + b^2 \cos^2 x} = \frac{1}{12} \tan^{-1}(3 \tan x) + c$ , then the maximum value of  $a \sin x + b \cos x$  is :

**Options:**

- (a)  $\sqrt{10}$
- (b)  $\sqrt{20}$
- (c)  $2\sqrt{10}$
- (d)  $2\sqrt{5}$

**Answer: (c)**

**Question:** If the function  $f(x) = \left(\frac{1}{x}\right)^{2x} x > 0$ , attains the maximum value at  $x = 1/e$  then

**Options:**

- (a)  $e^\pi < \pi^e$
- (b)  $e^{2\pi} < (2\pi)^e$
- (c)  $(2e)^\pi > (\pi)^{2e}$
- (d)  $e^\pi > \pi^e$

**Answer: (d)**

**Question:**  $\alpha, \beta$  are the roots  $x^2 + \sqrt{2}x - 8 = 0$ . Let  $U_n = \alpha_n + \beta_n$  then  $\frac{U_{10} + \sqrt{2}U_9}{2U_8}$  is equal to \_\_\_\_\_

**Answer: (4)**

**Question:** If the area bounded by the region  $(c, y)$  such that  $\left\{ (x, y) \mid \frac{a}{x^2} < y < \frac{1}{x}; 1 < x < 2, 0 < a < 1 \right\}$

is  $\left(\ln 2 - \frac{2}{7}\right)$  Sq. units, then  $(7a - 3)$  is equal to:

**Answer: (1)**

**Question:** If  $\vec{a} = 2i - j + k$  and  $\vec{b} = ((\vec{a} \times (i + j) \times i) \times i)$ ,

then the square of projection of  $\vec{a}$  on  $\vec{b}$

**Answer: (0)**

**Question:**  $\lim_{n \rightarrow \infty} \frac{\sum(n^4 - 2n^3 + n^2)}{\sum((3n)^4 + n^3 - n^2)}$  is equal to

**Options:**

- (a) 1/81

(b)  $1/72$

(c)  $1/57$

(d)  $1/93$

**Answer: (a)**

**Question:** If the order of matrix A is 3 and  $|a| = 3$  then the value of  $\det(\text{adj}(-4\text{adj}(-3\text{adj}(2A-1))))$  is  $2^m 3^n$ . The value of  $m + 2n$  is:

**Answer: (32)**

**Question:** If  $\int_0^3 \left( [x^2] + \left[ \frac{x^2}{2} \right] \right) dx = a + b\sqrt{2} + c\sqrt{6} - \sqrt{3} - \sqrt{5} - \sqrt{7}$  ( $a, b, c, \in \mathbb{I}$ ), then  $(a + b + c)$  equal to \_\_\_\_\_.

**Answer: (0)**

**Question:** If  $(\alpha, \beta, \gamma)$  is the mirror image of  $Q(3, -3, 1)$  in the line  $\frac{x-0}{1} = \frac{y-3}{1} = \frac{z-5}{-1}$

and  $R(2, 5, 3)$ . If the area of  $\Delta PQR$  is  $\lambda$ . The  $\frac{\lambda^2}{546}$  equals to :

**Answer: (0)**

**Question:** Sides of a triangle are  $AB = 9, BC = 7, AC = 8$ . Find  $\cos 3C$ .

**Answer: (0)**