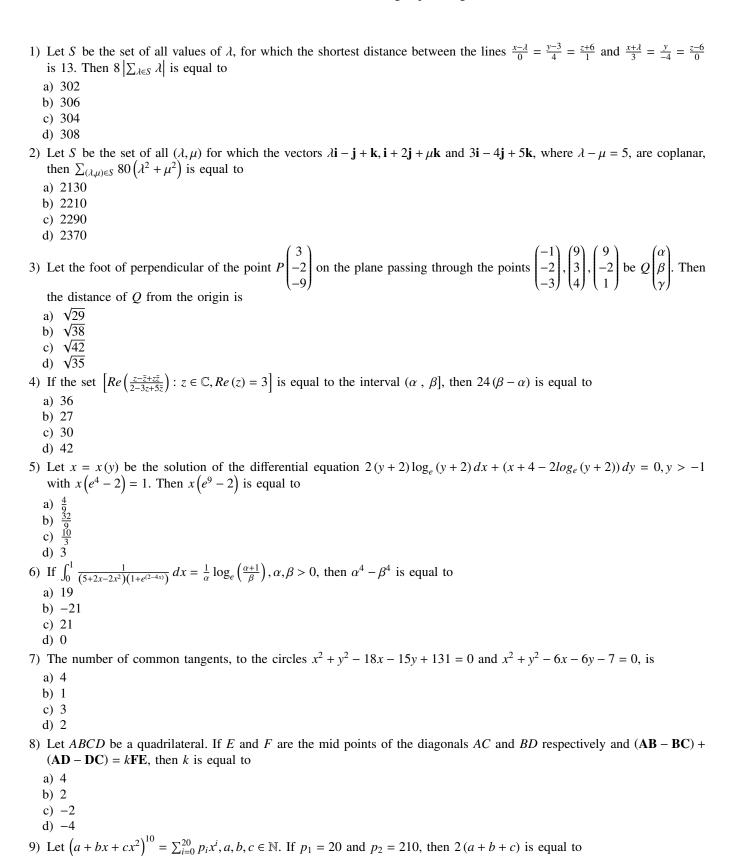
## JEE Main 2023 April 15 Shift 1

## EE24BTECH11002 - Agamjot Singh



a) 8

- b) 12
- c) 6
- d) 15
- 10) Let [x] denote the greatest integer function and  $f(x) = \max\{1 + x + [x], 2 + x, x + 2[x]\}, 0 \le x \le 2$ . Let m be the number of points in [0,2], where f is not continuous and n be the number of points in (0,2), where f is not differentiable. Then  $(m+n)^2 + 2$  is equal to
  - a) 6
  - b) 3
  - c) 2
  - d) 11
- 11) A bag contains 6 white and 4 black balls. A die is rolled once and the number of ball equal to the number obtained on the die are drawn from the bag at random. The probability that all the balls drawn are white is
  - a)

  - a)  $\frac{1}{4}$ b)  $\frac{9}{50}$ c)  $\frac{111}{50}$ d)  $\frac{1}{5}$
- 12) If the domain of the function  $f(x) = \log_e \left( 4x^2 + 11x + 6 \right) + \sin^{-1} \left( 4x + 3 \right) + \cos^{-1} \frac{10x + 6}{3}$  is  $(\alpha, \beta]$ , then  $36 |\alpha + \beta|$  is equal to
  - a) 72
  - b) 63
  - c) 45
  - d) 54
- 13) Let the determinant of a square matrix A of order m be m-n, where m and n satisfy 4m+n=22 and 17m+4n=93. If  $det(n \ adj(adj(m\mathbf{A}))) = 3^a 5^b 6^c$ , then a + b + c is equal to
  - a) 101
  - b) 84
  - c) 109
  - d) 96
- 14) The mean and standard deviation for 10 observations are 20 and 8 respectively. Later on, it was observed that one observation was recorded as 50 instead of 40. Then the correct variance is
  - a) 14
  - b) 11
  - c) 12
  - d) 13
- 15) If  $(\alpha, \beta)$  is the orthocenter of the triangle ABC with vertices  $A \begin{pmatrix} 3 \\ -7 \end{pmatrix}$ ,  $B \begin{pmatrix} -1 \\ 2 \end{pmatrix}$  and  $C \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ , then  $9\alpha 6\beta + 60$  is equal to
  - a) 30
  - b) 35
  - c) 40
  - d) 25