## 3 B Mains

## ai24btech11020 - Rishika Kotha

24)	The	equation	$e^{\sin x}$ –	$e^{-\sin x}$ -	- 4 =	0	has:	(2012)	
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- a. infinite number of real roots
- b. no real roots
- c. exactly one real root
- d. exactly four roots
- 25) The real number k for which the equation,  $2x^3 + 3x + 4 = 0$  has two distinct real roots in [0, 1](*JEEM*2013)
  - a. lies between 1 and 2
  - b. lies between 2 and 3
  - c. lies between -1 and 0
  - d. does not exist.
- 26) The number of values of k, for which the system of equations: (JEEM2013)(k+1)x + 8y = 4kkx + (k + 3)y = 3k - 1

has no solution, is

- a. infinite
- c. 2

b. 1

- d. 3
- 27) If the equations  $x^2 + 2x + 3 = 0$  and  $ax^2 + bx + c = 0$ , a,b,c  $\in \mathbb{R}$ , have a common root, then a:b:c is (JEEM2013)
  - a. 1:2:3
- c. 1:3:2
- b. 3:2:1
- d. 3:1:2
- 28) If  $a \in \mathbb{R}$  and the equation  $-3(x-[x])^2 + 2(x-[x])^2$ [x]) +  $a^2$  = 0 (where [x] denotes the greatest integer  $\leq x$ ) has no integral solution, then all possible values of a lie in the interval: (JEEM2014)
  - a. (-2, -1)
- c.  $(-1,0) \cup (0,1)$
- b.  $(-\infty, 2) \cup (2, \infty)$ 
  - d. (1,2)
- 29) Let  $\alpha$  and  $\beta$  be the roots of equation  $px^2 + qx + r = 0$ ,  $p \neq 0$ . If p,q,r are in A.P.

and  $\frac{1}{\alpha} + \frac{1}{\beta} = 4$ , then the value of  $|\alpha - \beta|$  is (JEEM2014)

- a.  $\frac{\sqrt{34}}{9}$  b.  $\frac{2\sqrt{13}}{9}$

- c.  $\frac{\sqrt{61}}{9}$ d.  $\frac{2\sqrt{17}}{9}$
- 30) Let  $\alpha$  and  $\beta$  be the roots of the equation  $x^2 - 6x - 2 = 0$ . If  $a_n = \alpha^n - \beta^n$ , for  $n \ge 1$ , then the value of  $\frac{a_{10}-2a_8}{2a_9}$  is equal to: (*JEEM*2015)
  - a. 3
- b. -3
- c. 6
- d. -6
- 31) The sum of all real values of x satisfying the equation  $(x^2 - 5x + 5)^{x^2+4x+60} = 1$  is : (*JEEM*2016)
  - a. 6
- b. 5 c. 3
- d. -4
- 32) If  $\alpha, \beta \in C$  are the distinct roots, of the equation  $x^2 - x + 1 = 0$ , then  $\alpha^{101} + \beta^{107}$  is (JEEM2018)equal to:
  - a. 0
- b. 1
- c. 2
- d. -1
- 33) Let p,q $\in \mathbb{R}$ . If  $2 \sqrt{3}$  is a root of the quadratic equation,  $x^2 + px + q = 0$ ,then: (JEEM2019 - 9April(M))
  - a.  $p^2 4q + 12 = 0$  c.  $q^2 + 4p + 14 = 0$ b.  $q^2 4p 16 = 0$  d.  $p^2 4q 12 = 0$