

JEE Chapter 3 A,B

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A. FILL IN THE BLANKS

- 1) The coefficient of x^{99} in the polynomial $(x-1)(x-2)\dots(x-100)$ is...
(1982 – 2Marks)
- 2) If $2+i\sqrt{3}$ is a root of the equation $x^2+px+q=0$, where p and q are real, then $(p, q) = (\dots, \dots)$
(1982 – 2Marks)
- 3) If the product of the roots of the equation

$$x^2 - 3kx + 2e^{2\ln k} - 1 = 0$$

then the roots are real for $k = \dots$
(1984 – 2Marks)

- 4) If the quadratic equation $x^2 + ax + b = 0$ and $x^2 + bx + c = 0$ ($a \neq b$) have a common root then value of $a + b$ is ...
(1986 – 2Marks)
- 5) The solution of equation $\log_7 \log_5 (\sqrt{x+5} + \sqrt{x}) = 0$ is ...
(1986 – 2Marks)
- 6) If $x < 0, y, 0, x + y + \frac{x}{y} = \frac{1}{2}$ and $(x + y)\left(\frac{x}{y}\right) = -\frac{1}{2}$, then $x = \dots$ and $y = \dots$
(1990 – 2Marks)
- 7) Let n and k be such positive numbers such that $n \geq \frac{(k)(k+1)}{2}$. The number of solutions $(x_1, x_2, \dots, x_k), x_1 \geq 1, x_2 \geq 2, \dots, x_k \geq k$, all integers, satisfying $x_1 + x_2 + \dots + x_k = n$, is ...
(1996 – 2Marks)
- 8) The sum of all the real roots of the equation $|x-2|^2 + |x-2| - 2 = 0$ is ...
(1997 – 2Marks)

B. TRUE / FALSE

- 1) For every integer $n > 1$, the inequality $(n!)^{\frac{1}{n}} < \frac{n+1}{2}$ holds.
(1981 – 2Marks)
- 2) The equation $2x^2 + 3x + 1 = 0$ has an irrational root.
(1983 – 1Mark)
- 3) If $a < b < c < d$, then the roots of the equation $(x-a)(x-c) + 2(x-b)(x-d) = 0$ are real and distinct.
(1984 – 1Mark)
- 4) If n_1, n_2, \dots, n_p are p positive integers, whose sum is an even number, then the number of odd integers among them is odd.
(1985 – 1Mark)
- 5) If $P(x) = ax^2 + bx + c$ and $Q(x) = -ax^2 + dx + c$, where $ac \neq 0$, then $P(x)Q(x) = 0$ has at least two real roots.
(1985 – 1Marks)

- 6) If x and y are positive real numbers and m, n are any positive integers, then $\frac{x^n y^m}{(1+x^{2n})(1+y^{2m})} > \frac{1}{4}$
(1989 – 1Mark)