BMS IIT FOUNDATION MATHEMATICS TEST PAPER

1. $(x+2)(x+3)(x-10) \geq 0$, holds for x $\in$
   (a) [−2, 10] (b) $[-3, -1] \cup [10, \infty)$
   (c) $[-3, -2] \cup [10, \infty)$ (d) none of these

2. Solution of the inequality, $x-3 < \sqrt{x^2+4x-5}$ is
   (a) $(-\infty, -5] \cup [1, \infty)$ (b) $(-5, 3]$
   (c) $(-\infty, -5] \cup (7/5, \infty)$ (d) none of these

3. All x for which $\dfrac{(3-x)(2x-1)(x-4)^2}{(x-1)^2(x-2)^3} \geq 0$ holds are given by:
   (a) $x \in \left(-\infty, \dfrac{1}{2}\right] \cup (2, \infty)$ (b) $x \in (2, 3] \cup [4, \infty)$
   (c) $x \in \left(-\infty, \dfrac{1}{2}\right] \cup (2, 3]$ (d) none of these

4. If $\dfrac{1}{x-1} + \dfrac{2}{x+1} > 0$; holds for x $\in$
   (a) $(-\infty, 5)$
   (b) [−1, 1)
   (c) $(-1, \frac{1}{3}) \cup (1, \infty)$
   (d) None of these

5. The number of real solutions of the equation $x^2 - 3|x| + 2 = 0$ is:
   (a) 3 (b) 4
   (c) 4 (d) 1

6. If $x^2 + 6x - 27 > 0$ then
   (a) $x < 3$ *or* $x > -9$ (b) $x < -9$ *or* $x > 3$
   (c) $-9 < x < 3$ (d) none of these

7. The set of all real numbers x, for which $x^2 - |x+2| + x > 0$ is:
   (a) $(-\infty, -2) \cup (2, \infty)$ (b) $\left(-\infty, -\sqrt{2}\right) \cup \left(\sqrt{2}, \infty\right)$
   (c) $(-\infty, -1) \cup (1, \infty)$ (d) $\left(\sqrt{2}, \infty\right)$

8. The solution of the equation $1-|x-1| \geq 0$ is:

(a) $(-\infty, 0)$ (b) $[0, \infty)$

(c) $[-2, 0]$ (d) $[0, 2]$

9. If $x+\frac{1}{x}=5$, then $\left(x^3+\frac{1}{x^3}\right)-5\left(x^2+\frac{1}{x^2}\right)+\left(x+\frac{1}{x}\right)=$

(a) 0 (b) 5

(c) –5 (d) 10

10. The number of roots of the equation $|x| = x^2 + x - 4$ is:

(a) 4 (b) 2

(c) 1 (d) 0

11. The value of $\sqrt{6+\sqrt{6+\sqrt{6+...to\ \infty}}}$ is _____.

12. If the sum of real roots of the equation $|x-3|^{3x^2-10x+3} = 1$ k, then the value of 3k is ____.

13. The set of values of x for which $|x-1|+|x+1|<4$ always holds true is (a,b) then the value of **b-a** is ____.

Answerkey:

1. c
2. a
3. c
4. c
5. c
6. b
7. b
8. d
9. a
10. b
11. 3.00
12. 19.00
13. 4.00