MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 28

Total Marks : 24

Max. Time : 30 min.

Topic : Fundamentals of Mathematics

Type of Questions **M.M., Min.**

Subjective Questions (no negative marking) Q.1,2,3,4,5,6 **(4 marks 5 min.)** **[24, 30]**

1. Solve the following equations :

(i) $\left|\,|x-1|-e\,\right| = 3$

(ii) $|x-3|^2 + |x-4| + x^2 + 7 = 0$

(iii) $|x-2| = \sqrt{x-4}$

(iv) $\dfrac{|x-2|}{x-1} = \dfrac{1}{x-1}$

2. Solve :

(i) $-2 \le \left|\,|x^2+1|-3\,\right| \le 7$

(ii) $|x^2 - 4x| \le 5$

(iii) $|x^2 - 2x| \le x$

(iv) $(x^2 - 9)\,(|x| - 2) \le 0$

3. Solve :

(i) $\dfrac{x^2 - 9\,|\,x\,| + 14}{x^2 - 12x + 36} \le 0$

(ii) $(|x| - 1)\,(|x\,| - 2) < 0$

(iii) $(\,|x^2 - 2| - 2)\,(x - 1) \ge 0$

4. Solve equation :

(i) $|x^2 - 2x| + |x^2 - 4x + 3| \le |2x - 3|$

(ii) $|x^2 - 4| - |2x - 1| = |x^2 - 2x - 3|$

5. Solve :

(i) $|\,x\,| \le a$

(ii) $x^2 \le a^2$

(iii) $a^2 \le x^2 \le b^2$

6. Solve :

(i) $a \le |x| \le b$

(ii) $|x| < \dfrac{a}{x}$

(iiii) $x^2 < 4^{|a|}$

Answers Key

1. (i) $x = e + 4, -e - 2$ (ii) No solution (iii) $x \in \phi$
(iv) $x = 3$

2. (i) $[-3, 3]$ (ii)$[-1, 5]$ (iii) $[1, 3] \cup \{0\}$
(iv) $[-3, -2] \cup [2, 3]$

3. (i) $[-7, -2] \cup [2, 6) \cup (6, 7]$ (ii) $(-2, -1) \cup (1, 2)$
(iii) $[-2, 1] \cup [2, \infty)$

4. (i) $x \in [0, 1] \cup [2, 3]$
(ii) $x \in \left[-1, \frac{1}{2}\right] \cup [3, \infty)$

5. (i) $\begin{cases} -a \le x \le a & \text{if } a > 0 \\ x = 0 & \text{if } a = 0 \\ x \in \phi & \text{if } a < 0 \end{cases}$ (ii) $x \in [-|a|, |a|]$

(iii) $x \in [-|b|, -|a|] \cup [|a|, |b|]$

6. (i) $\begin{cases} [-b, -a] \cup [a, b] & \text{if } a \ge 0, b > 0 \\ \phi & \text{if } a < 0, b < 0 \\ [-b, b] & \text{if } a < 0, b > 0 \\ 0 & \text{if } b = 0 \end{cases}$

(ii) $\begin{cases} \left(-\sqrt{-a}, 0\right) & \text{if } a < 0 \\ \phi & \text{if } a = 0 \\ \left(0, \sqrt{a}\right) & \text{if } a > 0 \end{cases}$ (iiii) $x \in (-2^{|a|}, 2^{|a|})$