

**Subject: MATHEMATICS**  
**Test Topics- log, mod, inequality**

- Q.1 If  $3 < |x| < 6$ , then  $x$  belongs to :
- (A)  $(-6, -3) \cup (3, 6)$  (B)  $(-6, 6)$   
(C)  $(-3, -3) \cup (3, 6)$  (D) None of these
- Q.2 If  $|x| < x$ , then :
- (A)  $x$  is a positive real number  
(B)  $x$  is a non-negative real number  
(C) there is no  $x$  satisfying this inequality  
(D)  $x$  is a negative real number
- Q.3  $\left| x + \frac{2}{x} \right| < 3$ , then  $x$  belongs to :
- (A)  $(-2, -1) \cup (1, 2)$  (B)  $(-\infty, -2) \cup (-1, 1) \cup (2, \infty)$   
(C)  $(-2, 2)$  (D)  $(-3, 3)$
- Q.4  $(x^2 + 1)(x - 1)(x - 2) < 0$ , then :
- (A)  $x < 1$  or  $x > 2$  (B)  $x \in (1, 2)$   
(C)  $-1 < x < 2$  (D) None of these
- Q.5  $(x^2 + 1)(x - 2)^2(x - 3) < 0$ , then  $x$  belongs to :
- (A)  $(-\infty, 2) \cup (2, 3)$  (B)  $(-\infty, 3)$   
(C)  $(2, 3)$  (D) None of these
- Q.6 The set of values of  $x$  satisfying the inequalities  $(x - 1)(x - 2) < 0$  and  $(3x - 7)(2x - 3) > 0$  is :
- (A)  $(1, 2)$  (B)  $\left( 2, \frac{7}{3} \right)$   
(C)  $\left( 1, \frac{7}{3} \right)$  (D)  $\left( 1, \frac{3}{2} \right)$
- Q.7 The values of  $x$  satisfying  $|x - 4| + |x - 9| = 5$ , is :
- (A)  $x = 4, 9$  (B)  $4 \leq x \leq 9$   
(C)  $x \leq 4$  or  $x \geq 9$  (D) None of these
- Q.8 The number  $\log_2 7$  is
- (a) An integer (b) A rational number  
(c) An irrational number (d) A prime number
- Q.9 If  $\frac{2x}{2x^2 + 5x + 2} > \frac{1}{x + 1}$ , then
- (a)  $-2 > x > -1$  (b)  $-2 \geq x \geq -1$   
(c)  $-2 < x < -1$  (d)  $-2 < x \leq -1$

Q.10 If for real values of  $x$ ,  $x^2 - 3x + 2 > 0$  and  $x^2 - 3x - 4 \leq 0$ , then

- (a)  $-1 \leq x < 1$  (b)  $-1 \leq x < 4$   
(c)  $-1 \leq x < 1$  or  $2 < x \leq 4$  (d)  $2 < x \leq 4$

Q.11 The number of integral solution of  $\frac{x+1}{x^2+2} > \frac{1}{4}$  is

- (a) 1 (b) 2 (c) 5 (d) None of these

Q.12 The set of all real numbers  $x$  for which  $x^2 - |x+2| + x > 0$ , is

- (a)  $(-\infty, -2) \cup (2, \infty)$  (b)  $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$  (c)  $(-\infty, -1) \cup (1, \infty)$  (d)  $(\sqrt{2}, \infty)$

Q.13 The solution set of  $\left| \frac{x+1}{x} \right| + |x+1| = \frac{(x+1)^2}{|x|}$  is

- (a)  $\{x \mid x \geq 0\}$  (b)  $\{x \mid x > 0\} \cup \{-1\}$   
(c)  $\{-1, 1\}$  (d)  $\{x \mid x \geq 1 \text{ or } x \leq -1\}$

Q.14

$\frac{1}{1+\log_b a + \log_b c} + \frac{1}{1+\log_c a + \log_c b} + \frac{1}{1+\log_a b + \log_a c}$  is equal to :

- (A)  $abc$  (B)  $\frac{1}{abc}$   
(C) 0 (D) 1

Q.15 If  $4^{\log_9 3} + 9^{\log_2 4} = 10^{\log_x 83}$ , ( $x \in r$ ), then  $x$  is :

- (A) 4 (B) 9 (C) 10 (D) None of these

Q.16 Least value of  $2 \log_{10} x - \log_x (0.01)$  for  $x > 1$  is :

- (A) 1 (B) 2  
(C) 4 (D) 6

Q.17 The set of values of  $x$  satisfying the inequalities  $(x-1)(x-2) < 0$  and  $(3x-7)(2x-3) > 0$  is :

- (A)  $(1, 2)$  (B)  $(1, 3 \setminus 2)$   
(C)  $(2, 7 \setminus 3)$  (D)  $(3 \setminus 2, 2)$

Q.18  $(x-1)(x^2 - 5x + 7) < (x-1)$ , then  $x$  belongs to :

- (A)  $(1, 2) \cup (3, \infty)$  (B)  $(2, 3)$   
(C)  $(-\infty, 1) \cup (2, 3)$  (D) None of these

Q.19 Solution of the equations  $\log_3 (x+y)$  and  $x^2 + y^2 = 65$  is :

- (A)  $x = 8, y = 1$  (B)  $x = 1, y = 8$   
(C)  $(x=8, y=1); (x=1, y=8)$  (D) None of the above

Q.20 The number of real roots of the equation  $x^2 - 3|x| + 2 = 0$  is:

- (A) 4 (B) 2  
(C) 0 (D) None of these