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Chapter End Test

Date : _____ Duration: 45 Min. Max. Marks : 25	**Mathematics** **Topic :** Sets & Relations and Functions (Set-1)	**BATCH** **XI**

General instruction:

1. This paper consist of two Sections. Students has to attempt both sections.
2. Section – A is objective carry 1 mark each.
3. Section – B is subjective.

[Section – A]

1. List all the elements of the following set $\{x : x^2 \le 10, x \in Z\}$

(a) {0, 1, 2, 3} (b) {1, 2, 3}

(c) {–3, –2,–1, 0, 1, 2, 3} (d) {–3, –2, –1, 1, 2, 3}

2. If A = ϕ then number of elements in P(A) will be

(a) 0 (b) 1

(c) 2 (d) not define

3. If A = {*a, b,* {*c, d*}, *e*} then which of the following is true

(a) {*c, d*} $\subset$ A (b) {*a, b, c*} $\subset$ A

(c) {ϕ} $\subset$ A (d) {*a, b, e*} $\subset$ A

4. What will be all possible subsets of {1, {1}}

(a) {1}, {{1}}, {1, 1} (b) {1}, {{1}}, {1,{1}}

(c) {1}, {{1}}, {1, 1} ϕ (d) {1}, {{1}}, {1, {1}}, ϕ

5. What will be the set builder form of the interval [–20, 3)

(a) $\{x : x \in R, -20 < x < 3\}$ (b) $\{x : x \in R, -20 < x \le 3\}$

(c) $\{x : x \in Z, -20 \le x < 3\}$ (d) $\{x : x \in R, -20 \le x < 3\}$

6. If A = {4, 8, 12, 16, 20} and B = {5, 10, 15, 20}, then A – B will be

(a) {20} (b) {4, 5, 8, 10, 12, 15, 16, 20}

(c) {5, 10, 15} (d) {4, 8, 12, 16}

7. If two finite sets have *m* and *n* elements. The total number of subsets of the first set is 56 more than total number of subsets of the second set. Then the value of *m* and *n*.

(a) 7, 6 (b) 5, 1

(c) 6, 3 (d) 8, 7

8. If A is finite set containing *n* element, then number of subset of A will be

(a) $2n$ (b) n^2

(c) $2^n - 1$ (d) 2^n

9. Let A = {1, 2, 3} and B = {2, 3, 4} then which of the following is a function from A to B.

(a) {(1, 2), (1, 3), (2, 3), (3, 3)} (b) {(1, 3), (2, 4), (2, 3)}

(c) {(1, 3), (2, 2), (3, 3)} (d) {(1, 2), (2, 3), (3, 2), (3, 4)}

10. The range of $f(x) = \cos [x]$ (where $[\cdot]$ is greatest integers function) for $-\frac{\pi}{2} < x < \frac{\pi}{2}$ is

(a) $[-1, 1]$ (b) $\{\cos 1, \cos 2, 1\}$

(c) $\{\cos 1, -\cos 1, 1\}$ (d) $\{-1, 1, 0\}$

11. If $x \neq 1$ and $f(x) = \frac{x+1}{x-1}$ is a real function, then $f[f[f(2)]]$ is

(a) 1 (b) 2

(c) 3 (d) 4

12. If $f : R \to R$ and $g : R \to R$ are defined by $f(x) = 2x + 3$ and $g(x) = x^2 + 7$, then the value of x such that $g(f(x)) = 8$

(a) 1, 2 (b) –1, –2

(c) 1, –2 (d) –1, 2

13. The range of the function $f(x) = |x - 1|$ is

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

(c) $[0, \infty)$ (d) $(-\infty, \infty)$

14. The domain of $f(x) = \sqrt{x^2 - 9}$ is

(a) (–3, 3) (b) [–3, 3]

(c) R – (–3, 3) (d) R – [–3, 3]

15. The range of the function $f(x) = \frac{x+2}{|x+2|}$ if $x \neq -2$ is

(a) $\{-1, 1\}$ (b) $\{-1, 0, 1\}$

(c) $\{1\}$ (d) $\{0, \infty\}$

[Section – B]

16. (a) Determine the domain and range of the relation R defined by R = $\{(x, x^3) : x$ is prime number less than 10$\}$ **[2]**

(b) Find domain and range of real function $f(x) = -|x - 1|$ **[2]**

17. (a) Find domain and range of real function $f(x) = \sqrt{16 - x^2}$ **[2]**

(b) In a survey of 100 person it was found that 28 read magazine A, 30 read magazine B, 42 read magazine C, 8 read magazine A and B, 10 read magazine A & C and 5 read magazine B and C and 3 read all the three magazines. Find **[4]**

(i) How many read none of three magazines.

(ii) How many read exactly one magazines only

OR

(a) A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to total of 58 men and only 3 men got medals in all three sports, how many received medals exactly in two of three sports. **[4]**

(b) (i) Find domain of real function $f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$ **[1]**

(ii) Find range of real function **[1]**

(a) $f(x) = x^2 + 3$ (b) $f(x) = 2 - 3x, x > 0$

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Hints/Solutions to Chapter End Test

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[Section – A]

1. (c)
2. (b)
3. (d)
4. (d)
5. (d)
6. (d)
7. (c)
8. (d)
9. (c)
10. (b)
11. (c)
12. (b)
13. (c)
14. (d)
15. (a)