

# HERAMB PROFESSIONAL INSTITUTE

CA-CPT / MATHEMATICS

MARKS: 30

DURATION: 1 HR

- The number of subsets of the sets  $\{6, 8, 11\}$  is:  
(A) 9 (B) 6 (C) 8 (D) None of these.
- If the universal set  $E = \{x \mid x \text{ is a positive integer } < 25\}$ ,  $A = \{2, 6, 8, 14, 22\}$ ,  $B = \{4, 8, 10, 14\}$ , then  
(A)  $(A \cap B)' = (A' \cap B')$  (B)  $(A \cap B)' = A' \cap B'$   
(C)  $(A' \cap B') = \varphi$  (D) None of these.
- Let  $A = \{1, 3, 5, 7, 8, 9\}$  and  $B = \{3, 5, 8\}$ , then  $A \Delta B$  is:  
(A)  $\{1, 7, 9\}$  (B)  $\{3, 5, 8\}$  (C)  $\varphi$  (D) None of these.
- Out of 2000 staff 48% professionals, 112 joined industry, 120 started practice and 160 joined as service. There were 32 who were in both practice and service, 40 in both practice and industry and 20 in both industry and service. There were 12 who did all the three. How many could not get any of these?  
(A) 360 (B) 280 (C) 160 (D) None of these.
- In a town of 20,000 families it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C, 5% families buy A and B, 3% buy B and C and 4% buy A and C. if 2% families buy all the three newspaper, then the number of families which buy A only is:  
(A) 6600 (B) 6300 (C) 5600 (D) 600.
- If  $f(x) = x + 3$ ,  $g(x) = x^2$ , then  $f(x) \cdot g(x)$  is :  
(A)  $(x + 3)^2$  (B)  $x^2 + 3$  (C)  $x^3 + 3x^2$  (D) None of these.
- The range of the function  $f(x) = \log_m(1 + x)$  for the domain of real values of  $x$  when  $0 \leq x \leq 9$  is:  
(A)  $\{0, -1\}$  (B)  $\{0, 1, 2\}$  (C)  $\{0, 1\}$  (D) None of these.
- If  $f(x) = x + 3$ ,  $g(x) = x^2$ , then  $f \circ g(x)$  is:  
(A)  $x^2 + 3$  (B)  $x^2 + x + 3$  (C)  $(x + 3)^2$  (D) None of these.
- The domain of  $\{(1, 7)\} \cup \{(2, 6)\}$  is :  
(A)  $(1, 6)$  (B)  $(7, 6)$  (C)  $(1, 2)$  (D)  $\{6, 7\}$ .
- Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be a function given by  $f(x) = x^2 + 1$ , then  $f^{-1}(1-5)$  is equal to  
(A)  $\{-5\}$  (B)  $\emptyset$  (C)  $\{2, 3\}$  (D) None of these.
- If  $f(x) = x + 3$ ,  $g(x) = x^2$ , then  $g \circ f(x)$  is equal to  
(A)  $(x + 3)$  (B)  $x^2 + 3$  (C)  $x^2(x + 3)$  (D) None of these.
- Let  $A = \{a, b\}$ . set of subsets of  $A$  is called power set of  $A$  denoted by  $P(A)$ . Now  $n(P(A))$  is:  
(A) 2 (B) 4 (C) 3 (D) None of these
- If  $f: \mathbb{R} \rightarrow \mathbb{R}$ ,  $f(x) = 2x + 7$  the the inverse of  $f$  is :  
(A)  $f^{-1}(x) = (x-7)/2$  (B)  $f^{-1}(x) = (x + 7)/2$   
(C)  $f^{-1}(x) = (x+3)/2$  (D) None of these.
- The range of the relation  $\{(x, y) : x \in \mathbb{N}, y \in \mathbb{N}, \text{ and } x + y = 10\}$  is:  
(A)  $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  (B)  $\{9, 8, 7, 6, 5, 4, 3, 2, 1\}$   
(C)  $\{1, 2, 3, 4, 5, 7\}$  (D) None of these

15. The sets  $V = \{x/x + 2 = 0\}$ ,  $R = \{x/x^2 + 2x = 0\}$  and  $S = \{x : x^2 + x - 2 = 0\}$  are equal to one another if  $x$  is equal to  
 (A) -2 (B) 2 (C) 1/2 (D) none of these
16. In a group of 20 children. 8 drink tea but not coffee and 13 like tea. The number of children drinking coffee but not tea is:  
 (A) 6 (B) 7 (C) 1 (D) none of these
17. The set  $\{n(n+1)/2 : n \text{ is a positive integer}\}$  is:  
 (A) a finite set (B) an infinite set (C) an empty set (D) none of these
18. If  $R$  is the set of positive rational number and  $E$  is the set of real numbers, then  
 (A)  $R \subseteq E$  (B)  $R \subset E$  (C)  $E \subset R$  (D) none of these
19. The set of cubes of the natural is:  
 (A) a finite set (B) an infinite set (C) a null set (D) none of these
20. If  $R$  is the set of isosceles right angled triangles and  $I$  is set of isosceles triangles, then  
 (A)  $R=I$  (B)  $R \supset I$  (C)  $R \subset I$  (D) none of these
21.  $\{1-(-1)^x\}$  for all integral  $x$  is the set  
 (A)  $\{0\}$  (B)  $\{2\}$  (C)  $\{0, 2\}$  (D) none of these
22.  $E$  is a set of positive even number and  $O$  is a set of positive odd numbers, then  $E \cup O$  is a  
 (A) set of whole numbers (B)  $N$   
 (C) a set of rational number (D) none of these
23. The set  $\{0, 2, 4, 6, 8, 10\}$  can be written as:  
 (A)  $\{2x/0 < x < 5\}$  (B)  $\{x : 0 \leq x \leq 5\}$  (C)  $\{2x : 0, \leq x \leq 5\}$  (D) none of these
24.  $A \cup (B - C)$  is:  
 (A)  $\{a, b, c, d, e, f, i\}$  (B)  $\{a, b, c, d, e, f, o\}$  (C)  $\{a, b, c, d, e, f, u\}$  (D) none of these
25. Identify the elements of  $P$  if set  $Q = \{1,2,3\}$  and  $P \times Q = \{(4,1) (4,2) (4,3) (5,1) (5,2) (5,3) (6,1)(6,3)\}$   
 (A)  $\{3,4,5\}$  (B)  $\{4,5,6\}$  (C)  $\{5,6,7\}$  (D) none of these
26. The function  $f(x) = 2^x$  is:  
 (A) one-one mapping (B) one-many (C)  $\log_{10}(1/x)$  (D) none of these
27. The range of  $\{(3,0), (2,0), (1,0), (0,0)\}$  is:  
 (A)  $\{0,0\}$  (B)  $\{0\}$  (C)  $\{0,0,0\}$  (D) none of these
28.  $\{x, y\} | x < y$  is:  
 (A) not a function (B) a function (C) one-one mapping (D) none of these
29. If  $g : R \rightarrow R$ , be defined by  $g(x) = \frac{x}{x-y}$   $f(x) = x^2 + 2$ , then  $f \circ g$  is :  
 (A)  $\frac{x^2}{(x-1)^2}$  (B)  $\frac{x^2}{(x-1)^2} + 2$  (C)  $\frac{x^2+2}{x^2+1}$  (D) none of these
30. If  $f(x) = 1 - x$ , then  $f^{-1}(x)$  is :  
 (A)  $1-x$  (B)  $(x - 1/x)$  (C)  $x/x - 1$  (D) none of these