11th chapter 1 - 1 mark

11th Standard

Maths

Reg.No. : | | | | | | |

Exam Time : 01:14:00 Hrs

Total Marks : 74

74 x 1 = 74

1) The number of constant functions from a set containing m elements to a set containing n elements is
(a) mn (b) m (c) n (d) m+n

2) The function f:[0,2π]→[-1,1] defined by f(x)=sin x is
(a) one-to-one (b) on to (c) bijection (d) cannot be defined

3) If the function f:[-3,3]→S defined by $f(x)=x^2$ is onto, then S is
(a) [-9,9] (b) R (c) [-3,3] (d) [0,9]

4) Let X={1,2,3,4}, Y={a,b,c,d} and f={f(1,a),(4,b),(2,c),(3,d),(2,d)}. Then f is
(a) an one-to-one function (b) an onto function (c) a function which is not one-to-one (d) not a function

5) The inverse of $f(x)=\begin{cases} x & if \quad x<1 \\ x^2 & if \quad 1\le x\le 4 \\ 8\sqrt{x} & if \quad x>4 \end{cases}$ is

(a) $f^{-1}(x)=\begin{cases} x & if \quad x<1 \\ \sqrt{x} & if \quad 1\le x\le 16 \\ \frac{x^2}{64} & if \quad x>1 \end{cases}$ (b) $f^{-1}(x)=\begin{cases} -x & if \quad x<1 \\ \sqrt{x} & if \quad 1\le x\le 16 \\ \frac{x^2}{64} & if \quad x>16 \end{cases}$ (c) $f^{-1}(x)=\begin{cases} x^2 & if \quad x<1 \\ \sqrt{x} & if \quad 1\le x\le 16 \\ \frac{x^2}{64} & if \quad x>16 \end{cases}$ (d) $f^{-1}(x)=\begin{cases} 2x & if \quad x<1 \\ \sqrt{x} & if \quad 1\le x\le 16 \\ \frac{x^2}{8} & if \quad x>16 \end{cases}$

6) Let f:R→R be defined by f(x)=1-|x|. Then the range of f is
(a) R (b) (1,∞) (c) (-1,∞) (d) (-∞,1]

7) The function f:R→R be defined by f(x)=sinx+cosx is
(a) an odd function (b) neither an odd function nor an even function (c) an even function (d) both odd function and even function

8) The function f:R→R is defined by $f(x)=\frac{(x^2-cosx)(1+x^2)}{(x-sinx)(2x-x^3)}+e^{-|x|}$ is
(a) an odd function (b) neither an odd function nor an even function (c) an even function (d) both odd function and even function.

9) Which one of the following is a finite set?
(a) {x:x∈Z, x< 5} (b) {x:x∈W, x≥5} (c) {x:x∈N, x > 10} (d) {x:x is an even prime number}

10) If A⊆B, then A\B is
(a) B (b) A (c) Ø (d) $\frac{B}{A}$

11) Given A={5,6,7,8}. Which one of the following is incorrect?
(a) Ø⊆A (b) A⊆A (c) {7,8,9}⊆A (d) {5}⊆A

12) The shaded region in the adjoining diagram represents.

(a) A\B (b) B\A (c) AΔB (d) A'

13) The shaded region in the adjoining diagram represents.

(a) A\B (b) A' (c) B' (d) B\A

14) Let R be a relation on the set N given by R={(a,b):a=b-2, b > 6}. Then
(a) (2,4)∈R (b) (3,8)∈R (c) (6,8)∈R (d) (8,7)∈R

15) If A={1,2,3}, B={1,4,6,9} and R is a relation from A to B defined by "x is greater than y". The range of R is
(a) {1,4,6,9} (b) {4,6,9} (c) {1} (d) None of these

16) For real numbers x and y, define xRy if x-y+√2 is an irrational number. Then the relation R is
(a) reflexive (b) symmetric (c) transitive (d) none of these

17) Let R be the relation over the set of all straight lines in a plane such that $l_1Rl_2 \Leftrightarrow l_1 \perp l_2$. Then R is
(a) symmetric (b) reflexive (c) transitive (d) an equivalent relation

18) Which of the following is not an equivalence relation on z?
(a) aRb ⇔ a+b is an even integer (b) aRb ⇔ a-b is an even integer (c) aRb ⇔ a< b (d) aRb ⇔ a=b

19) Which of the following functions from z to itself are bijections (one-one and onto)?
(a) $f(x)=x^3$ (b) f(x)=x+2 (c) f(x)=2x+1 (d) $f(x)=x^2+1$

20) If A = {(x,y) : y = e^x, x∈R} and B = {(x,y) : y=e^{-x}, x ∈ R} then n(A∩B) is
(a) Infinity (b) 0 (c) 1 (d) 2

21) If A = {(x,y) : y = sin x, x ∈ R} and B = {(x,y) : y = cos x, X ∈ R} then A∩B contains
(a) no element (b) infinitely many elements (c) only one element (d) cannot be determined

22) The relation R defined on a set A= {0,-1, 1, 2} by xRy if $|x^2+y^2| \le 2$, then which one of the following is true?
(a) R = {(0,0), (0,-1), (0, 1), (-1, 0), (-1, 1), (1, 2), (1, 0)} (b) R^{-1} = {(0,0), (0,-1), (0, 1), (-1, 0), (1, 0)} (c) Domain of R is {0,-1, 1, 2} (d) Range of R is {0,-1, 1}

23) If f(x) = |x - 2| + |x + 2|, x ∈ R, then
(a) $f(x) = \begin{cases} -2x \ if \ x \in (-\infty, -2] \\ 4 \ if \ x \in (-2, 2] \\ 2x \ if \ x \in (2, \infty) \end{cases}$ (b) $f(x) = \begin{cases} -2x \ if \ x \in (-\infty, -2] \\ 4x \ if \ x \in (-2, 2] \\ -2x \ if \ x \in (2, \infty) \end{cases}$ (c) $f(x) = \begin{cases} -2x \ if \ x \in (-\infty, -2] \\ -4x \ if \ x \in (-2, 2] \\ 2x \ if \ x \in (2, \infty) \end{cases}$ (d) $f(x) = \begin{cases} -2x \ if \ x \in (-\infty, -2] \\ 2x \ if \ x \in (-2, 2] \\ 2x \ if \ x \in (2, \infty) \end{cases}$

24) Let R be the set of all real numbers. Consider the following subsets of the plane R x R: S = {(x, y) : y =x + 1 and 0 < x < 2} and T = {(x,y) : x - y is an integer} Then which of the following is true?
(a) T is an equivalence relation but S is not an equivalence relation (b) Neither S nor T is an equivalence relation (c) Both S and T are equivalence relation (d) S is an equivalence relation but T is not an equivalence relation.

25) Let A and B be subsets of the universal set N, the set of natural numbers. Then A'∪[(A∩B)∪B'] is
(a) A (b) A' (c) B (d) N

26) The number of students who take both the subjects Mathematics and Chemistry is 70. This represents 10% of the enrollment in Mathematics and 14% of the enrollment in Chemistry. The number of students take at least one of these two subjects, is
(a) 1120 (b) 1130 (c) 1100 (d) insufficient data

27) If n((A x B) ∩(A x C)) = 8 and n(B ∩ C) = 2, then n(A) is
(a) 6 (b) 4 (c) 8 (d) 16

28) If n(A) = 2 and n(B ∪ C) = 3, then n[(A x B) ∪ (A x C)] is
(a) 2^3 (b) 3^2 (c) 6 (d) 5

29) If two sets A and B have 17 elements in common, then the number of elements common to the set A x B and B x A is
(a) 2^{17} (b) 17^2 (c) 34 (d) insufficient data

30) Let f:Z→Z be given by f(x)= $\begin{cases} \frac{x}{2} & if \ \ x \ \ is \ \ even \\ 0 & if \ \ x \ \ is \ \ odd \end{cases}$. Then f is
(a) one-one but not onto (b) onto but not one-one (c) one-one and onto (d) neither one-one nor onto

31) If f:R→R is given by f(x)=3x-5, then f^{-1}(x) is
(a) $\frac{1}{3x-5}$ (b) $\frac{x+5}{3}$ (c) does not exist since f is not one-one (d) does not exists since f is not onto

32) If f(x)=2x-3 and g(x)=x^2+x-2 then gof(x) is
(a) 2($2x^2$-5x+2) (b) ($2x^2$-5x-2) (c) 2($2x^2$+5x+2) (d) $2x^2$+5x-2

33) Let f: R→R be given by f(x)=x+$\sqrt{x^2}$ is
(a) injective (b) Surjective (c) bijective (d) none of these

34) For non-empty sets A and B, if A ⊂ B then (A x B) ∩ (B x A) is equal to
(a) A ∩ B (b) A x A (c) B x B (d) none of these.

35) The number of relations on a set containing 3 elements is
(a) 9 (b) 81 (c) 512 (d) 1024

36) Let R be the universal relation on a set X with more than one element. Then R is
(a) not reflexive (b) not symmetric (c) transitive (d) none of the above

37) Let X = {1, 2, 3, 4} and R = {(1, 1), (1, 2), (1, 3), (2, 2), (3, 3), (2, 1), (3, 1), (1, 4),(4, 1)}. Then R is
(a) reflexive (b) symmetric (c) transitive (d) equivalence

38) The range of the function $\frac{1}{1-2sinx}$ is
(a) $(-\infty, -1) \cup (\frac{1}{3}, \infty)$ (b) $(-1, \frac{1}{3})$ (c) $[-1, \frac{1}{3}]$ (d) $(-\infty, -1] \cup [\frac{1}{3}, \infty)$

39) The range of the function $f(x) = |\lfloor x \rfloor - x|, x \in R$ is
(a) [0, 1] (b) [0, ∞) (c) [0, 1) (d) (0, 1)

40) The rule f(x) =x^2 is a bijection if the domain and the co-domain are given by
(a) R, R (b) R, (0, ∞) (c) (0, ∞); R (d) [0, ∞); [0,∞)

41) The number of reflective relations one set containing n elements is:
(a) 2^{12} (b) 2^4 (c) 2^{16} (d) 2^8

42) The number of relations from a set containing 4 elements to a set containing 3 elements is:
(a) 2^{16} (b) 2^5 (c) 2^7 (d) 2^{12}

43) Domain of the function $y = \frac{x-1}{x+1}$ is:
(a) 1R (b) Q (c) R-(-1) (d) R-1

44) If $f : R \to R$ is defined by $f(x) = 2x - 3$:
(a) $\frac{1}{2x-3}$ (b) $\frac{1}{2x+3}$ (c) $\frac{x+3}{2}$ (d) $\frac{x-3}{2}$

45) $n(A \cap B) = 4$ and $(A \cup B) = 11$ then $n(p(A \triangle B))$ is:
(a) 44 (b) 256 (c) 64 (d) 128

46) $n(p(A)) = 512, n(p(B)) = 32, n(A \cup B) = 16$, find $n(A \cap B)$:
(a) 2 (b) 9 (c) 4 (d) 5

47) Let S = (1, 2, 3), R be (1, 1) (1, 2) (2, 2) (1, 3) (3, 1), what are the elements to-be included to make R reflexive:
(a) (3, 3) (b) (2, 3) (c) (3, 2) (d) none of these

48) The natural domain of the function $y = \sqrt{9 - x^2}$ is:
(a) $-3 \leq x \leq 3$ (b) -3 < x < 3 (c) 0 < x < 3 (d) $(-\infty, -3) \cup (3, \infty)$

49) Let X = {a, b,c},y = (1,2,3) then $f : x \to y$ given by (a, 1) (b, 1) (c, 1) is called:
(a) onto (b) constant function (c) one one (d) bijective

50) If $f : [-2, 2] \to A$ is given by f(x)=3^3 then f is onto, if A is:
(a) [3, 3] (b) (3, 3) (c) [-24,24] (d) (-24, 24)

51) Which one of the following statements is false? The graph of the function $f(x) = \frac{1}{x}$
(a) exist is the first and third quadrant only (b) is a reciprocal function (c) is defined at x = 0 (d) it is symmetric about y = x and y = - x.

52) Which of the following functions is an even function?
(a) $f(x) = \frac{2^x + 2^{-n}}{2^x - 2^{-x}}$ (b) $f(x) = \frac{3^x + 1}{3^x - 1}$ (c) $f(x) = \frac{x.3^x - 1}{3^x + 1}$ (d) $f(x) = log(x + \sqrt{x^2 + 1})$

53) The domain of the function $f(x) = \sqrt{x - 5} + \sqrt{6 - x}$ is
(a) [5, ∞) (b) (- ∞, 6) (c) [5, 6] (d) (-5, ≠6)

54) The domain of the function $f(x) = \sqrt{4 - \sqrt{4 - \sqrt{4 - x^2}}}$
(a) (-∞, 4) (b) (-4, ∞) (c) (- 2,2) (d) [- 2,2]

55) The domain of the function $f(x) = \sqrt{log_{10} \frac{3-x}{x}}$ is
(a) $(0, \frac{3}{2})$ (b) (0, 3) (c) $(-\infty, \frac{3}{2}]$ (d) $(0, \frac{3}{2}]$

56) The range of the function is $f(x) = \sqrt{3x^2 - 4x + 5}$ is
(a) $\left(-\infty, \sqrt{\frac{11}{3}}\right)$ (b) $\left(-\infty, -\sqrt{\frac{11}{3}}\right)$ (c) $\left(\sqrt{\frac{11}{3}}, -\infty\right)$ (d) none

57) The function f(x) = log (x + $\sqrt{x^2 + 1}$) is
(a) an even function (b) an odd function (c) a periodic function (d) neither an even nor an odd function

58) Let f and g be two odd functions then the function of f o g is
(a) an even function (b) an odd function (c) neither even nor odd (d) a periodic function

59) If f(x) = 1 - x, x ∈ [- 3, 3] then the domain off is
(a) [- 2,3] (b) (- 2,3) (c) (- 3, -2) (d) [-2, 3)

60) If $f(x) = \frac{1-x}{1+x}, x \neq 0$ then $f[f(x)] + f\left[f\left(\frac{1}{x}\right)\right]$
(a) < 2 (b) ≥ 2 (c) > 2 (d) None

61) If $f(x) = \frac{1-x}{1+x}, (x \neq 0)$ then $f^{-1}(x)$ =
(a) f(x) (b) $\frac{1}{f(x)}$ (c) -f(x) (d) $-\frac{1}{f(x)}$

62) If A = {1,2}, B = {1,3} then n(A x B) =
(a) 2 (b) 4 (c) 8 (d) 0

63) If n(A) = 1024 then n[P(A)] =
(a) 2^{10} (b) $2^{2^{10}}$ (c) cannot be determined (d) 4^{10}

64) Which one of the following is false?
(a) A∩(BΔ\C) = (A ∩ B)Δ(A ∩ C) (b) A∩(B - C) = (A ∩B) \ (A∩C) (c) (A U B), = A' ∩ B' (d) (A \ B) U B = A ∩ B

65) If A = {x / x is an integer, $x^2 \leq 4$} then elements of A are
(a) A = {-1, 0, 1} (b) A = {-1, 0, 1, 2} (c) A = {0, 2, 4} (d) A = {- 2, - 1, 0, 1, 2}

66) Which one of the following is not a singleton set?
(a) A = {x : 3x - 5 = 0, x ∈ Q} (b) B = {| x | = 1 / x ∈ Z} (c) {x : x^3 - 1 = 0, x ∈ R} (d) {x : 30x = 60, x ∈ N}

67) n[P[P[p(Ø)]]] =
(a) 2 (b) 1 (c) 4 (d) 8

68) If A, B and C are three sets and if A ∈ B and B ⊂ C then
(a) A ⊂ C (b) A need not be a subset of C (c) A = B (d) C ⊂ A

69) Which one of the following is false?
(a) (A')' = A (b) AUA' = A (c) A∩A' = Ø (d) AUA' = U

70) If X and Y are two sets such that n (X) = 17, n (Y) = 23 and n(X U Y) = 38. Then n (X n 1) =
(a) 0 (b) cannot determined (c) 6 (d) 2

71) For any four sets A, B, C and D, which of the following is not true?
(a) A x C ⊆ B x D(b) (A x B) ∩ (C x D) = (A ∩ C) x (B ∩ D)(c) A x (B U,C) = (A x B) U (A x C)(d) A x (B ∩ C) = (A x B) ∩ (A x C)

72) If A and B are any two finite sets having m and n elements respectively then the cardinality of the power set of A x B is

(a) 2^m (b) 2^n (c) mn (d) 2^{mn}

73) The domain and range of the function f(x) = -|x|

(a) R (- ∞, 0] (b) (0,∞), (- ∞,0) (c) (-∞,∞), (0, ∞) (d) R, R

74) The domain and range of the function $f(x) = \frac{|x-4|}{x-4}$

(a) R, [-1, 1] (b) R \ {4};{-1,1} (c) R \ {4};{-1,l} (d) R, (-1,1)

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74 x 1 = 74

1) (c) n
2) (b) on to
3) (d) [0,9]
4) (d) not a function
5) (a) $f^{-1}(x) = \begin{cases} x & if \quad x < 1 \\ \sqrt{x} & if \quad 1 \leq x \leq 16 \\ \frac{x^2}{64} & if \quad x > 1 \end{cases}$
6) (d) (-∞,1]
7) (b) neither an odd function nor an even function
8) (c) an even function
9) (d) {x:x is an even prime number}
10) (c) Ø
11) (c) {7,8,9}⊆A
12) (c) AΔB
13) (d) B\A
14) (c) (6,8)∈R
15) (c) {1}
16) (a) reflexive
17) (a) symmetric
18) (c) aRb ⇔ a<b
19) (b) f(x)=x+2
20) (c) 1
21) (c) only one element
22) (d) Range of R is {0,-1, 1}
23) (a) $f(x) = \begin{cases} -2x \; if \; x \in (-\infty, -2] \\ 4 \; if \; x \in (-2, 2] \\ 2x \; if \; x \in (2, \infty) \end{cases}$
24) (a) T is an equivalence relation but S is not an equivalence relation
25) (d) N
26) (b) 1130
27) (b) 4
28) (c) 6
29) (b) 17^2
30) (b) onto but not one-one
31) (b) $\frac{x+5}{3}$
32) (a) $2(2x^2-5x+2)$
33) (d) none of these
34) (b) A x A
35) (c) 512
36) (c) transitive
37) (b) symmetric
38) (d) $(-\infty, -1] \cup [\frac{1}{3}, \infty)$
39) (c) [0, 1)
40) (d) [0, ∞); [0,∞)
41) (a) 2^{12}
42) (d) 2^{12}
43) (c) R-(-1)

44) (c) $\frac{x+3}{2}$

45) (d) 128

46) (a) 2

47) (a) (3, 3)

48) (a) $-3 \leq x \leq 3$

49) (b) constant function

50) (c) [-24,24]

51) (c) is defined at x = 0

52) (c) $f(x) = \frac{x.3^x-1}{3^x+1}$

53) (c) [5, 6]

54) (d) [- 2,2]

55) (d) $(0, \frac{3}{2}]$

56) (c) $\left(\sqrt{\frac{11}{3}}, -\infty\right)$

57) (b) an odd function

58) (b) an odd function

59) (a) [- 2,3]

60) (b) ≥ 2

61) (a) f(x)

62) (b) 4

63) (b) $2^{2^{10}}$

64) (d) (A \ B) U B = A ∩ B

65) (d) A = {- 2, - 1, 0, 1, 2}

66) (b) B = {| x | = 1 / x ∈ Z}

67) (c) 4

68) (b) A need not be a subset of C

69) (b) AUA' = A

70) (d) 2

71) (a) A x C ⊆ B x D

72) (d) 2^{mn}

73) (a) R (- ∞, 0]

74) (b) R \ {4};{-1,1}