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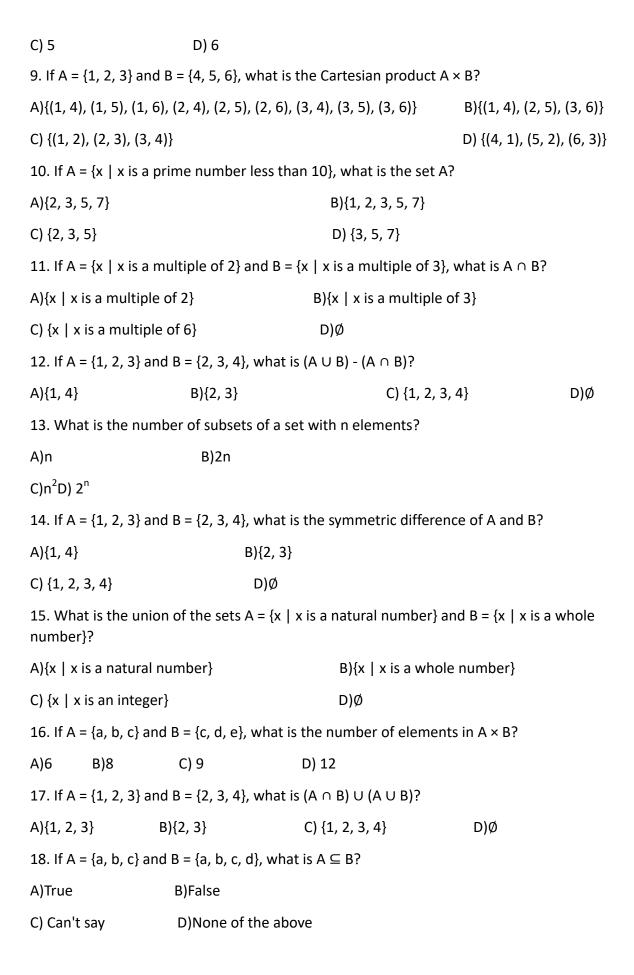
(Autonomous)

BCA I Semester

Skill Enhancement Course- Mathematics for Computing

Question Bank

1. What is the definition of a set?

A)A collection of ordered elements B)A collection of unique objects

C) A collection of numbers D) A collection of variables

2. What is the union of the sets {1, 2, 3} and {3, 4, 5}?

A) {1, 2, 3} B){3, 4, 5}

C) {1, 2, 3, 4, 5} D) {3}

3. If A = {x | x is an even number} and B = {x | x is a prime number}, what is A ∩ B?

A) {2} B){4, 6, 8}

C) {1, 2, 3} D)∅

4. What is the complement of the set A = {x | x is an even number} with respect to the universal set U = {1, 2, 3, 4, 5, 6}?

A) {2, 4, 6} B){1, 3, 5}

C) {1, 2, 3, 4, 5} D)∅

5. Which of the following is a disjoint set?

A)A = {1, 2, 3} and B = {3, 4, 5} B)A = {1, 2, 3} and B = {4, 5, 6}

C) A = {1, 2, 3} and B = {1, 2, 3} D) A = {1, 2, 3} and B = ∅

6. What is the power set of A = {a, b}?

A){{}, {a}, {b}, {a, b}} B){{a}, {b}, {a, b}}

C) {{}, {a}, {b}} D) {{a, b}}

7. What is the symmetric difference of the sets A = {1, 2, 3} and B = {3, 4, 5}?

A){1, 2} B){4, 5}

C) {1, 2, 4, 5} D) {3}

8. What is the cardinality of the set A = {a, b, c, d}?

A)3 B)4

C) 5   D) 6

9. If A = {1, 2, 3} and B = {4, 5, 6}, what is the Cartesian product A × B?

A){(1, 4), (1, 5), (1, 6), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6)}   B){(1, 4), (2, 5), (3, 6)}

C) {(1, 2), (2, 3), (3, 4)}   D) {(4, 1), (5, 2), (6, 3)}

10. If A = {x | x is a prime number less than 10}, what is the set A?

A){2, 3, 5, 7}   B){1, 2, 3, 5, 7}

C) {2, 3, 5}   D) {3, 5, 7}

11. If A = {x | x is a multiple of 2} and B = {x | x is a multiple of 3}, what is A ∩ B?

A){x | x is a multiple of 2}   B){x | x is a multiple of 3}

C) {x | x is a multiple of 6}   D)∅

12. If A = {1, 2, 3} and B = {2, 3, 4}, what is (A ∪ B) - (A ∩ B)?

A){1, 4}   B){2, 3}   C) {1, 2, 3, 4}   D)∅

13. What is the number of subsets of a set with n elements?

A)n   B)2n

C)n^2D) 2^n

14. If A = {1, 2, 3} and B = {2, 3, 4}, what is the symmetric difference of A and B?

A){1, 4}   B){2, 3}

C) {1, 2, 3, 4}   D)∅

15. What is the union of the sets A = {x | x is a natural number} and B = {x | x is a whole number}?

A){x | x is a natural number}   B){x | x is a whole number}

C) {x | x is an integer}   D)∅

16. If A = {a, b, c} and B = {c, d, e}, what is the number of elements in A × B?

A)6   B)8   C) 9   D) 12

17. If A = {1, 2, 3} and B = {2, 3, 4}, what is (A ∩ B) ∪ (A ∪ B)?

A){1, 2, 3}   B){2, 3}   C) {1, 2, 3, 4}   D)∅

18. If A = {a, b, c} and B = {a, b, c, d}, what is A ⊆ B?

A)True   B)False

C) Can't say   D)None of the above

19. What does the intersection of two sets represent in a Venn diagram?

A)Elements that are in either set   B)Elements that are in both sets

C) Elements that are in neither set   D) Elements that are in one set but not the other

20. In a Venn diagram, what does the area outside the circles represent?

A)The union of the sets   B)The intersection of the sets

C) The universal set   D) The complement of the sets

21. Which of the following Venn diagrams represents two disjoint sets?

A)Two overlapping circles   B)Two separate circles

C) One circle inside another   D)None of the above

22. What does the union of two sets represent in a Venn diagram?

A)Elements that are in both sets B)Elements that are in either set

C) Elements that are in neither set   D) Elements that are in one set but not the other

23. Which Venn diagram represents the sets A and B if A ∪ B = B?

A)Two overlapping circles   B)One circle inside another

C) Two separate circles   D)None of the above

24. In a Venn diagram with two sets A and B, what does the region outside both circles represent if the universal set U is represented by the rectangle?

A)A ∪ B   B) A ∩ B   C) (A ∪ B)'   D) None of the above

25. What does the Venn diagram of two sets A and B represent if A Δ B = A ∪ B?

A)A and B are disjoint   B) A and B are identical

C) A and B overlap   D)None of the above

26. Let A = {1, 2} and B = {3, 4}. What is the Cartesian product A × B?

A) {(1, 3), (2, 4)}   B) {(3, 1), (4, 2)}
C) {(1, 3), (1, 4), (2, 3), (2, 4)}   D) {(1, 1), (2, 2), (3, 3), (4, 4)}

27. If A has m elements and B has n elements, how many elements will A × B have?

A) m + n   B) m − n   C) m × n   D) m^n

28. Which of the following pairs represents a relation from A = {1, 2} to B = {3, 4}?

A) {(3, 1), (4, 2)}   B) {(1, 3), (2, 4)}C) {(1, 2), (2, 3)}   D) {(4, 1), (3, 2)}

29. Let A = {x, y}, B = {1, 2}, and define a relation R = {(x, 1), (y, 2)}. What is the domain of R?

A) {1, 2}   B) {x, y}   C) {(x, 1), (y, 2)}   D) {x, 2}

30. If R is a relation on set A = {1, 2}, which of the following is a valid relation?

A) {(1, 2), (2, 3)}   B) {(2, 2), (2, 1)}   C) {(1, 2), (3, 1)}D) {(2, 1), (3, 3)}

31. A relation R on a set A is said to be reflexive if:

A) (a, a) ∈ R for all a ∈ A   B) (a, b) ∈ R implies (b, a) ∈ R
C) (a, b) ∈ R and (b, C)∈ R implies (a, C)∈ R   D) (a, a) ∉ R for all a ∈ A

32. A relation R is symmetric if:

A) (a, b) ∈ R ⇒ (b, a) ∈ R   B) (a, a) ∈ R for all a ∈ A
C) (a, b) ∈ R ⇒ (a, a) ∈ R   D) (a, b) ∈ R ⇒ (c, a) ∈ R

33. A relation R on set A = {1, 2, 3} is defined as R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 1)}. Which of the following properties does R satisfy?

A) Reflexive only   B) Reflexive and Symmetric
C) Symmetric and Transitive   D) Reflexive, Symmetric and Transitive

34. What is the domain of the relation R = {(1, 2), (3, 4), (5, 6)}?

A) {2, 4, 6}   B) {1, 3, 5}   C) {1, 2, 3, 4, 5, 6}D)∅

35. The relation R = {(1, 1), (2, 2), (3, 3), (1, 2), (2, 3)} on A = {1, 2, 3} is:

A) Reflexive and Transitive   B) Symmetric and Reflexive
C) Transitive only   D) Not transitive

36. A relation R on a set A = {1, 2, 3} is reflexive if:

A) (1, 1), (2, 2) ∈ R   B) (1, 1), (2, 2), (3, 3) ∈ R
C) (1, 2), (2, 3) ∈ R   D) (1, 3), (2, 1) ∈ R

37. The relation R = {(a, b) ∈ℝ × ℝ | a = b} is:

A) Reflexive only   B) Symmetric only
C) Reflexive, Symmetric, and Transitive   D) None of the above

38. Which of the following is not a property of an equivalence relation?

A) Reflexive   B) Symmetric   C) TransitiveD) Anti-symmetric

39. A relation R on set A is symmetric and transitive but not reflexive. Which of the following could be an example?

A) R = ∅ on A = {1, 2}   B) R = {(1,1), (2,2)}
C) R = {(1,2), (2,1)}   D) R = {(1,1), (1,2), (2,1)}

40. The range of the relation R = {(1, 2), (3, 4), (5, 6)} is:

A) {1, 3, 5}   B) {2, 4, 6}   C) {1, 2, 3, 4, 5, 6}D)∅

41. A relation R on a set A is anti-symmetric if:

A) (a, b) ∈ R ⇒ (b, a) ∈ R   B) (a, b) ∈ R and (b, a) ∈ R ⇒ a = b
C) (a, a) ∈ R for all a ∈ A   D) (a, b), (b, C)∈ R ⇒ (a, C)∈ R

42. A function from A to B is a relation where:

A) Every element of B has at least one image in A
B) Every element of A has exactly one image in B
C) Every element of B has exactly one image in A
D) Every element of A has multiple images in B

43. Let A = {1, 2} and B = {3, 4}. Which of the following is a function from A to B?

A) {(1, 3), (2, 4)}   B) {(1, 3), (1, 4)}C) {(3, 1), (4, 2)}D) {(1, 3), (2, 3), (2, 4)}

44. A function that is both one-one and onto is called:

A) Inverse function   B) Identity function
C) Constant function   D)Bijective function

45. If f(x) = x² and g(x) = x + 1, then (f ∘ g)(x) is:

A) x² + 1   B) (x + 1)²   C) x² + x + 1D) x² + 2x + 2

46. The domain of the function f(x) = √(x − 2) is:

A) x ≥ 2   B) x > 0   C) x ≤ 2   D) x ≠ 2

47. The domain of a function is:

A) The set of output values
B) The set of input values for which the function is defined
C) The set of values for which the function is zero
D) None of the above

48. The range of a function is:

A) The set of input values   B) The set of possible output values
C) The set of undefined values   D) Always equal to domain

49. The function f(x) = 1/(x² − 4) is undefined at:

A) x = ±2   B) x = 0   C) x = 4   D) x = 2 only

50. What is the range of the function:

f(x) = √(4 − x²)?

A) [0, 2]   B) (0, 2)   C) (−2, 2)   D) [−2, 2]

51. Which of the following is a complex number?

   A) 5   B) 3 + 2i   C) √2   D) -7

52. The real part of (7 - 4i) is

   A) -4   B) 7   C) 4   D) i

53. The imaginary part of (3 + 5i) is:

 A) 3 B) 1 C) 5   D) -5

54. The complex conjugate of (6 + 2i) is:

   A) 6 - 2i   B) 6 + 2i   C) -6 + 2i   D) 2 - 6i

55. The modulus of (3 + 4i) is:

   A) 5   B) 7   C) 25   D) √7

56. The argument of (1 + i) is:

   A) π/4   B) π/2   C) π/3   D) π/6

57. If z = 2 - 3i, then $|z|^2$ equals:

   A) 13   B) -13   C) 7   D) √13

58. Which point represents 2 + 3i in the Argand plane?

A) (2, 3)   B) (3, 2)   C) (-2, 3)   D) (2, -3)

59. If z = a + ib, then $\bar{z}$ equals:

   A) a–ib   B) a + ib   C) -a + ib   D) -a - ib

60. If z_1 = 2 + 3i and z_2 = 1 - i, then $z_1 + z_2$ equals:

   A) 3 + 2i   B) 3 + 4i   C) 1 + 2i   D) 2 + 2i

61. If z_1 = 2 + i and z_2 = 1 - i, then $z_1 z_2$ equals:

   A) 3   B) 2   C) 1 + I   D) 3 - i

62. If z = 4(cos 60° + i sin 60°), then |z| = ?

   A) 2   B) 4   C) 8   D) √3

63. The cube roots of unity satisfy the equation:

   A) x^3 = 1   B) x^2 = 1   C) x^3 = -1   D) x^2 + x + 1 = 0

64. The non-real cube roots of unity are:

   A) ω, $ω^2$ B) 1, ω   C) 1, $ω^2$ D) ω, 1

65. If z = cos θ + i sin θ, then $\bar{z}$ equals:

   A) cos θ - i sin θ   B) cos θ + i sin θ   C) -cos θ + i sin θ   D) -cos θ - i sin θ

66. If z = 3 - 4i, then arg(z) lies in:

   A) First quadrant   B) Second quadrant   C) Third quadrant   D) Fourth quadrant

67. The multiplicative inverse of (a + ib) is:

A) 1/(a+ib)B) (a - ib)/(a²+b²)C)(a+ib)/(a²+b²)D)(a - ib)/(a²-b²)

68. If $z = i$, then z^4 equals:

A) 1B) -1C)iD)-i

69. If $z_1 = 1 + i$ and $z_2 = 1 - i$, then z_1/z_2 equals:

A) iB) -iC) 1D) -1

70. If $z = -1 + \sqrt{3}\,i$, then $|z| = ?$

A) 2B) $\sqrt{2}$C) $\sqrt{3}$D) 4

71. The sum of cube roots of unity is:

A) 0B) 1C)3D) -1

72. If $z = \cos 120° + i \sin 120°$, then $z^3 = ?$

A) 1B) -1C)iD) 0

73. If $z = 2i$, then $z^2 = ?$

A) -4B) 4C)2iD)-2i

74. If $z_1 = 3 + 2i$ and $z_2 = 3 - 2i$, then $z_1 z_2 = ?$

A) 13B) 5C)9D) −13

75. The square of modulus of $z = (5 - 12i)$ is:

A) 169B) 13C)25D) 144

76. The nth term of an A.P. with first term 5 and common difference 3 is:
A) 5nB) 3n + 2C) 5 + (n-1)3D) 2n + 5

77. If the 10th term of an A.P. is 50 and first term is 5, then common difference is:
A) 2B) 3C)4D)5

78. The sum of first 20 terms of an A.P. whose first term is 2 and common difference 3 is:
A) 400B) 610C)620D)660

79. The arithmetic mean between 10 and 18 is:
A) 12B) 14C)16D)20

80. The nth term of a G.P. with first term 2 and common ratio 3 is:
A) 2nB) $2 \times 3^{(n-1)}$C)$2 \times n^3$D)3n + 2

81. The 5th term of a G.P. with a=3, r=2 is:
A) 24B) 48C)96D)36

82. The sum of first 6 terms of G.P. with a=2, r=2 is:
A) 62B) 64C)66D)126

83. The sum to infinity of G.P. 4, 2, 1, 1/2, … is:

A) 7B) 8C)6D)9

84. The geometric mean between 4 and 9 is:

A) 5B) 6C)7D)√36

85. If a sequence is in H.P., then its reciprocals are in:

A) G.P.B) A.P.C)H.P.D)None

86. The harmonic mean between 6 and 12 is:

A) 7B) 8C)9D)10

87. If A.M. between two numbers is 20 and their G.M. is 16, then H.M. is:

A) 12.8B) 15.5C)16D)18

88. In an A.P., if a=7, d=3, then the 15th term is:

A) 47B) 50C)59D)53

89. The sum of first 10 natural numbers is:

A) 45B) 50C)55D)60

90. The common difference of the A.P. 5, 11, 17, 23… is:

A) 5B) 6C)7D)8

91. The sum of first n odd natural numbers is:

A) n^2B) $2n^2$C)n(n+1)D)n^2 + n

92. The nth term of H.P. whose reciprocals form the A.P. 2, 4, 6,… is:

A) 1/(2n)B) 1/(2+2n)C)1/(2n+2)D)1/(2n-1)

93. The sum of first n terms of G.P. 1, 2, 4, 8,… is:

A) 2^nB) 2^n– 1C)$2^{(n+1)}$D)2n – 1

94. If A.M. = 10 and H.M. = 6.4, then G.M. is:

A) 8B) 8.5C)9D)7.5

95. If the common ratio of G.P. is 1/2 and first term is 8, then S∞ is:

A) 8B) 12C)16D)20

96. The 8th term of A.P. 3, 8, 13, … is:

A) 33B) 35C)38D)43

97. If first term of an A.P. is 12, last term is 32, number of terms is 11, then common difference is:
A) 1B) 2C)3D)4

98. The sum of first 12 multiples of 7 is:
A) 462B) 504C)546D)588

99. In a G.P., if a=5, r=1, then sum of first 10 terms is:
A) 5B) 25C)50D)55

100. The relation between A.M., G.M. and H.M. of two positive numbers is:
A) A.M. ≤ G.M. ≤ H.M.B) A.M. ≥ G.M. ≥ H.M.
C)A.M. = G.M. = H.M.D)None

Answer Key

Q.N.	Answer	Q.N.	Answer	Q.N.	Answer	Q.N.	Answer
1	B	26	C	51	B	76	C
2	C	27	D	52	B	77	D
3	A	28	B	53	C	78	B
4	B	29	B	54	A	79	B
5	B	30	B	55	A	80	B
6	A	31	A	56	A	81	B
7	C	32	A	57	A	82	D
8	B	33	B	58	A	83	B
9	A	34	B	59	A	84	B
10	A	35	D	60	A	85	B
11	C	36	B	61	D	86	B
12	A	37	C	62	B	87	A
13	D	38	D	63	A	88	C
14	A	39	A	64	A	89	C
15	B	40	B	65	A	90	B
16	C	41	B	66	D	91	A
17	C	42	B	67	B	92	A
18	A	43	A	68	A	93	B
19	B	44	D	69	A	94	A
20	D	45	B	70	A	95	C
21	B	46	A	71	A	96	C
22	B	47	B	72	A	97	B
23	B	48	B	73	A	98	C
24	C	49	A	74	A	99	C
25	A	50	A	75	A	100	B