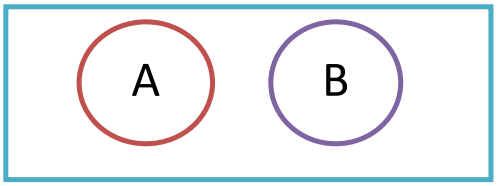
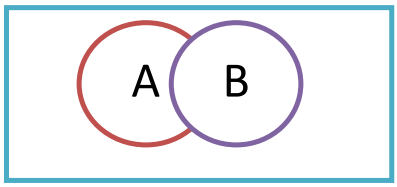
	Question Bank of Mathematical FoundationCA-1.4(254104)	ANS
1)	An ordered collection of objects are called _____ A.Relation B.Set C.Function D.Proposition	**B**
2)	A set is collection of ordered _____. A. Elements B. Numbers C. Objects D. All of the above	**D**
3)	The set 'A' of odd positive numbers less than 10 can show by _____ A.{1, 2, 3} B.{1, 5, 7, 9, 11} C.{1, 2, 5, 9} D.{1, 3, 5, 7, 9}	**D**
4)	What is the Cartesian product of A = {1, 2} and B = {a, c}? A.{(1, a), (1, c), (2, a), (d, c)} B.{(1, 1), (2, 2), (a, a), (d, d)} C.{(1, a), (2, a), (1, c), (2, d)} D.{(1, 1), (a, a), (2, a), (1, c)}	A
5)	The Cartesian Product B x A is equal to the Cartesian product A x B. A.True B.False	**B**
6)	What is the cardinality of the set of odd positive integers less than 10? A. 10 B. 5 C. 3 D. 20	**B**

7)	Which of the following two sets are equal? A. A = {1, 2} and B = {1} B. A = {1, 2} and B = {1, 2, 3} C. A = {1, 2, 3} and B = {2, 1, 3} D. A = {1, 2, 4} and B = {1, 2, 3}	C
8)	The set {0, 1, 2} having Cardinality of the Power set? A.7 B.6 C.8 D.9	**C**
9)	The members of the set S = {x | x is the cube of an integer and x < 10} is _____ A. 1 8 10 B. 1 4 9 C. 1 8 D. None of the above	C
10)	The members of the set S = {x | x is the square of an integer and x < 100} is _____ A.{0, 2, 4, 5, 9, 58, 49, 56, 99, 12} B.{0, 1, 4, 9, 16, 25, 36, 49, 64, 81} C.{1, 4, 9, 16, 25, 36, 64, 81, 85, 99} D.{0, 1, 4, 9, 16, 25, 36, 49, 64, 121}	**B**
11)	The union of the sets {11, 12, 15} and {11, 12, 16} is the set _____ A.{11, 12, 16,} B.{11, 12, 15, 16} C.{11, 12, 11} D.{11, 15, 16, 13}	**B**
12)	The intersection of the sets {1, 2, 5,6} and { 2,3,4,5 6} is the set _____ A.{1, 2 , 4} B.{3, 5, 6} C.{2, 5 ,6 } D.{1,2,3,4,5, 6}	**C**

13)	Two sets are called disjoint if there _____ is the empty set. A.Union B.Difference C.Intersection D.Complement	**C**
14)	The difference of the B-A, where A= {1, 2, 3, 4} and B= {1, 2, 4, 5} is? A.{1} B.{5} C.{3} D.{2}	**B**
15)	What is complement of the set A _____ A.A – B B.U – A C.A – U D.B – A	**C**
16)	Which is the symbol for null set ? A. Σ B. μ C. ∧ D. ϕ	**D**
17)	Let Ai = {i, i+1, i+2, …..}. Then set {n, n+1, n+2, n+3, …..} is the _____ of the set Ai. A.Union B.Intersection C.Set Difference D.Disjoint	**B**
18)	In this diagram A and B are------  A. Equal sets B. Overlapping sets C. Disjoint sets D. None	**C**

19)	In this diagram A and B are------  A. Equal sets B. Disjoint sets C. Both A & B D. None	**D**
20)	Complement of a set B in denoted by A. B' B. B ° C. {B} D. B^2	**A**
21)	What is the set difference of set A with null set is _____ A.A B.null C.U D.B	**A**
22)	Let the set A is {1, 2, 3} and B is {2, 3, 4 ,8}. Then the total number of elements in (A U B) is? A.4 B.5 C.6 D.7	**B**
23)	Let the set A is {1, 2 } and B is {2, 3, 5 }. Then the total number of elements in (A ∩ B) is? A.1 B.2 C.3 D.4	**A**
24)	Let A be set of all prime numbers, B be the set of all even prime numbers, C be the set of all odd prime numbers, then which of the following is true? A.A ≡ B U C B.B is a singleton set. C.A ≡ C U {2} D.All of the mentioned	**D**

25)	If A has 3 elements B has 7 elements then the minimum and maximum number of elements in A U B are _____ A.3, 7 B.7, 10 C.3, 10 D.None of the mentioned	**B**
26)	Two sets A and B contains 'a' and 'b' elements respectively. If power set of A contains 16 more elements than that of B, value of 'b' and 'a' are _____ A.4, 5 B.6, 7 C.2, 3 D.None of the mentioned	**A**
27)	Let A be {11, 22, 23, 44}, U be set of all natural numbers, then U-A'(complement of A.is given by set. A.{11,22,33, 44, 55, 66, ….} B.{55, 66, 77, 88, 99, ……} C.{11, 22, 33, 44 } D.All of the mentioned Answer: c	**C**
28)	Which sets are not empty? A.{x: x is a even prime greater than 3} B.{x : x is a multiple of 2 and is odd} C.{x: x is an even number and x+3 is even} D.{ x: x is a prime number less than 5 and is odd}	**D**
29)	In a disjunction, even if one of the statements is false, the whole disjunction is still... A. False B. Negated C. True D. Both true and false	**C**

30)	Consider the statement form p ⇒ q where p = "If Ram is Puja's father then Puja isniece" and q = "Shyam is Ram's brother." Which of the following statements is equivalent to this statement? A.If Shyam is Ram's Brother, then Ram is Puja's father and Puja is not Shyam'sniece. B. If Shyam is not Ram's Brother, then Ram is Puja's father and Puja is not Shyam's niece. C.If Shyam is not Ram's Brother, then Ram is Puja's father or Puja is Shyam's niece. D.If Shyam is Ram's Brother, then Ram is Puja's father and Puja is Shyam's niece.	**B**
31)	The compound propositions p and q are called logically equivalent if _____ is a tautology. A. p ↔ q B. p → q C. ¬ (p ∨ q) D. ¬p ∨ ¬q	**A**
32)	p ∨ q is logically equivalent to _____ A.¬q → ¬p B.q → p C.¬p → ¬q D.¬p → q	**D**
33)	¬ (p ↔ q) is logically equivalent to _____ A.q↔p B.p↔¬q C.¬p↔¬q D.¬q↔¬p	**B**
34)	p ∧ q is logically equivalent to _____ A.¬ (p → ¬q) B.(p → ¬q) C.(¬p → ¬q) D.(¬p → q)	**A**
35)	Which of the following statement is correct? A.p ∨ q ≡ q ∨ p B.¬(p ∧ q) ≡ ¬p ∨ ¬q C.(p ∨ q) ∨ r ≡ p ∨ (q ∨ r) D.All of mentioned	**D**
36)	p ↔ q is logically equivalent to _____ A.(p → q) → (q → p) B.(p → q) ∨ (q → p) C.(p → q) ∧ (q → p) D.(p ∧ q) → (q ∧ p)	**C**

37)	$(p \rightarrow q) \wedge (p \rightarrow r)$ is logically equivalent to _____ A.$p \rightarrow (q \wedge r)$ B.$p \rightarrow (q \vee r)$ C.$p \wedge (q \vee r)$ D.$p \vee (q \wedge r)$	**A**
38)	$P \rightarrow (Q \rightarrow R)$ is equivalent to a)(P ^Q)-> R b)(P v Q)->R c)(P v Q)-> ⅂R d)None of these	**A**
39)	$\neg (p \leftrightarrow q)$ is logically equivalent to _____ A.$p \leftrightarrow \neg q$ B.$\neg p \leftrightarrow q$ C.$\neg p \leftrightarrow \neg q$ D.$\neg q \leftrightarrow \neg p$	**A**
40)	Let P (x) denote the statement "x >5." Which of these have truth value true? A.P (0) B.P (6) C.P (2) D.P (1)	**B**
41)	Let Q(x) be the statement "x < 5." What is the truth value of the quantification $\forall x Q(x)$, having domains as real numbers. A. True B. False	**B**
42)	Determine the truth value of $\forall n(n + 1 > n)$ if the domain consists of all real numbers. A.True B.False	**A**
43)	A biconditional is symbolized like this… A. p v q B. p↔ q C. p * q D. p ^ q	**B**
44)	Let R (x) denote the statement "x > 2." What is the truth value of the quantification $\exists x R(x)$, having domain as real numbers? A.True B.False	**A**

45)	The symbolization for a conjunction is... A. p → q B. p ∧ q C. p v q D. ~ p	**B**
46)	In a truth table for a two-variable argument, the first guide column has the following truth values: A. T, T, F, F B. F, F, T, T C. T, F, T, F D. T, F, F, F	**A**
47)	Which of the following are tautologies? A. ((P v Q) ^ Q) ↔ Q B. ((P v Q) ^ ⅂P) → Q C. ((P v Q) ^ P) → P D. Both (a) & (b)	**D**
48)	Which of the following propositions is tautology? A. (p v q)→q B. p v (q→p) C. p v (p→q). D. Both (b) & (c)	**C**
49)	Which of the proposition is p^ (~ p v q) is A. A tautology B. A contradiction C. Logically equivalent to p ^ q D. All of above	**C**
50)	”Everyone wants to learn cosmology.” This argument may be true for which domains? A.All students in your cosmology class B.All the cosmology learning students in the world C.Both of the mentioned D.None of the mentioned	**C**
51)	Number of ways in which 7 girls & 7 boys can be arranged such that no two boys and no two girls are together is A. 12!(2!)2 B. 7! 8! C. 2(7!)2 D. None of these	**C**

52)	A _____ is an arrangement of outcomes in which the order does not matter A. Permutation B. Combination C. Both A & B D. None of the above	**A**
53)	How many substrings (of all lengths inclusive) can be formed from a character string of length 8? (Assume all characters to be distinct) A.14 B.21 C.54 D.37	**D**
54)	A _____ is a grouping of outcomes in which the order does not matter E. Permutation F. Combination G. Both A & B H. None of the above	**B**
55)	What is formula of Combinations? A. ${}^{n}C_{r} = n!/ (n-r)!$ B. ${}^{n}C_{r} = n!/ r! (n-r)!$ C. Both A & B D. None of the above	**B**
56)	Let M be a sequence of 9 distinct integers sorted in ascending order. How many distinct pairs of sequences, N and O are there such that i) each are sorted in ascending order, ii) N has 5 and O has 4 elements, and iii) the result of merging N and O gives that sequence? A.84 B.35 C.194 D.138	**A**
57)	The number of ordered triplets (a, b, c), a, b, c $\in$ N, such that a + b + c <= 20 is A. Less than 100 B. Less than 1000 C. Equal to 1000 D. More than 1000	**D**
58)	A polygon has 44 diagonals. The number of its sides is A. 10 B. 11 C. 12 D. 13	**B**

59)	The number of ways in which a mixed doubles tennis game can be arranged between 10 players consisting of 6 men and 4 women is A. 180 B. 90 C. 48 D. 12	**A**
60)	The number of zeroes at the end of (127)! is A. 31 B. 30 C. 0 D. 10	**A**
61)	**Matrix obtained by changing rows and columns is called** A. rectangular matrix B. transpose C. symmetric D. none	**B**
62)	**Generally the elements of a matrix are denoted by** A. numbers B. capital letters C. small letters D. both A and C	**D**
63)	A symmetric matrix is a one in which? A.All diagonal elements are zero B.All diagonal elements are 1 C.$A = A^T$ D.$A = -A^T$	**C**
64)	An anti-symmetric matrix is a one in which? A.All diagonal elements are zero B.All diagonal elements are 1 C.$A = A^T$ D.$A = -A^T$	**D**
65)	**If** $\begin{bmatrix} 2+x & 3 & 4 \\ 1 & -1 & 2 \\ x & 1 & -5 \end{bmatrix}$ **is a singular matrix, then x is** (a) $\frac{13}{25}$ (b) $-\frac{25}{13}$ (c) $\frac{5}{13}$ (d) $\frac{25}{13}$	**B**
66)	If for a square matrix A and B,null matrix O, AB = O implies A=O and B=O. A.True B.False	**B**

67)	**Find the adjoint of the matrix** $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. (a) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -2 \\ -3 & 4 \end{bmatrix}$	**B**
68)	If matrix M= [1 3 6 5] and M^T (M transpose) is called A. Zero matrix B. Diagonal matrix C. Column matrix D. Row matrix	**C**
69)	For a skew symmetric odd ordered matrix A of integers, which of the following will hold true? A.detA.= 9 B.detA.= 81 C.detA.= 0 D.detA.= 4	**C**
70)	The Inverse exist only for non-singular matrices. A.True B.False	**A**
71)	If matrix M= $\begin{bmatrix} 4 & 10 \\ 2 & 5 \end{bmatrix}$ then determinant of matrix M A. 1 B. -1 C. 0 D. 10	**C**
72)	If A is a lower triangular matrix then A^T is a _____ A.Lower triangular matrix B.Upper triangular matrix C.Null matrix D.None of the mentioned	**B**

73)	The functions expressed in form of ratios and form of quotient of polynomials are A. rational functions B. irrational functions C. quotient function D. ratio function	**A**
74)	An onto function are known as injection. A.True B.False	**B**
75)	A function is a relation from a set of inputs to a set of possible outputs where each input is related to exactly one output is called. A. One to one function B. One to many function C. Many to one function D. Many to many function	
76)	function is a relation from a set of inputs to a set of possible outputs where each input is related to exactly one output is called. A. One to one function B. One to many function C. Many to one function D. Many to many function	
77)	If X is domain and Y is codomain then function represented *A.* $f : X \rightarrow Y$ *B.* $f : Y \rightarrow X$ C. Both A & B D. None of the above	
78)	Domain of function also called___ A. Output of function B. Input of function C. Both A & B D. None of the above	**B**
79)	Range of function also called___ A. Output of function B. Input of function C. Both A & B D. None of the above	**A**

80)	May possibly come out of a function is called the A. Domain B. Codomain C. Range D. None of the above	**B**
81)	Actually comes out of a function is called the Range A. Domain B. Codomain C. Range D. None of the above	**C**
82)	$f=cos(x)$is which kind of function A. Even Function B. Odd Function C. Composite Function. D. None of the above	**A**
83)	$f(x) = x/(x^2-1)$ A. Even Function B. Odd Function C. Composite Function. D. None of the above	**B**
84)	$f(x) = a^x$is which of the following is A. Exponential Function B. Rational Function C. Linear Function D. None of the above	**A**
85)	Function having same range as well as domain A. Exponential Function B. Rational Function C. Identity Function D. None of the above	**C**
86)	is a function whose (output) value is the same for every input value A. Constant function B. Rational Function C. Identity Function D. Exponential Function	**A**
87)	If $f(x)=4x^2-2x+5$ then $f(2)$=? A. 7 B. 17 C. 27 D. 37	**B**

88)	The Cartesian system is also called as A.Circular coordinate system B. Rectangular coordinate system C. Spherical coordinate system D. Space coordinate system	**B**
89)	If 2x+y=20 , x+y=10 then values of x & y are A. 5,5 B. 10,5 C. 10,0 D. 0,10	**C**
90)	The scalar factor of Cartesian system is unity. State True/False. A.True B.False	**A**
91)	Which of the following criteria is used to choose a coordinate system? A.Distance B.Intensity C.Magnitude D.Geometry	**D**
92)	The distance of the point P(-2, 6) from the x-axis is A.2 B.-2 C.6 D.-6	**B**
93)	If the coordinates of a point are (10, 0), then it lies in: A. X-axis B. Y-axis C. At origin D. Between x-axis and y-axis	**B**
94)	If the coordinates of a point are (0, -4), then line parallel to : A. X-axis B. Y-axis C. At origin D. Between x-axis and y-axis	**A**
95)	If y coordinate of a point is zero, then the point lies on: A. First quadrant B. Second quadrant C. X-axis D. Y-axis	**D**
96)	**The point P in Cartesian plane is located by an ordered pair called** A. (c, b, a) B. (a, b, c) C. (a, b) D. (b, a)	**C**

97)	Consider equation $x+5y=10$ if $x=0$ then y=? A. 5 B. 10 C. 2 D. 8	**C**
98)	Consider equation $4x+2y=10$ if $x=1$ then y=? A. 6 B. 3 C. 2 D. 7	**B**
99)	The point A(-5,5) is belongs to which Quadrants? A. Ist Quadrant B. IInd Quadrant C. IIIrd Quadrant D. IVth Quadrant	**C**
100)	If value of x is negative and y is negative then it lies on _ A. Ist Quadrant B. IInd Quadrant C. IIIrd Quadrant D. IVth Quadrant	**C**

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