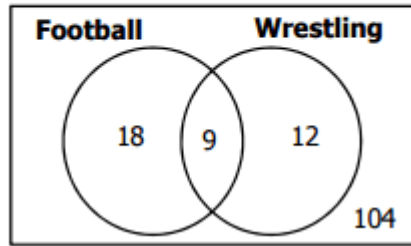| QN		ANS
	TYBSc (Mathematics) **Subject: MTH-304: Set Theory and Logic** **Question Bank**	
1	A _____ is an ordered collection of objects. A) Relation B) Function C) Set D) Proposition	**C**
2	Power set of empty set has exactly _____ subset. A) One B) Two C) Zero D) Three	**A**
3	What is the Cartesian product of A = {1, 2} and B = {a, b}? A) {(1, a), (1, b), (2, a), (b, b)} B) {(1, 1), (2, 2), (a, a), (b, b)} C) {(1, a), (2, a), (1, b), (2, b)} D) {(1, 1), (a, a), (2, a), (1, b)}	**C**
4	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**
5	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**
6	The number of subsets of a set containing n elements is A) n B) 2n - 1 C) n^2 D) 2n	**D**
7	The symmetric difference of A = {1, 2, 3} and B = {3, 4, 5} is A) {1, 2} B) {1, 2, 4, 5} C) {4, 3} D) {2, 5, 1, 4, 3}	**B**
8	R is a relation from {11, 12, 13} to {8, 10, 12} defined by y = x − 3. The relation R − 1 is A) {(11, 8), (13, 10)} B) {(8, 11), (10, 13)} C) {(8, 11), (9, 12), (10, 13)} D) None of the above	**B**
9	The relation R defined on the set of natural numbers as {(a, b): a differs from b by 3} is given A) {(1, 4), (2, 5), (3, 6), ….} B) { (4, 1), (5, 2), (6, 3), ….} C) {(4, 1), (5, 2), (6, 3), ….}	**B**

	D) None of the above	
10	R is a relation on N given by N = {(x, y): 4x + 3y = 20}. Which of the following belongs to R? A) (– 4, 12) B) (5, 0) C) (3, 4) D) (2, 4)	D
11	Let X be a family of sets and R be a relation in X, defined by 'A is disjoint from B'. Then, R is A) reflexive B) symmetric C) anti-symmetric D) transitive	B
12	If A = { (1, 2, 3}, then the relation R = {(2, 3)} in A is A) Symmetric And Transitive Only B) Symmetric Only C) Transitive Only D) Not Transitive	D
13	The set O of odd positive integers less than 10 can be expressed by _____ A) {1, 2, 3} B) {1, 3, 5, 7, 9} C) {1, 2, 5, 9} D) {1, 5, 7, 9, 11}	B
14	The set of positive integers is _____ A) Infinite B) Finite C) Subset D) Empty	A
15	A' will contain how many elements from the original set A A) 1 B) Infinite C) All elements in A D) 0	D
16	(A')' = ? A) U B) A C) U-A D) A'	B
17	If A is not equal to B, then the Cartesian product ? A) None of the above B) is not possible C) A x B = B >< A D) A x B not equal B x A	D
18	The intersection of sets A and B is expressed as ? A) AnB B) A/B C) A-B D) AxB	A
19	If A has m elements and B has n elements, then A x B has elements ? A) m x n B) m – n C) 2n D) m + n	A
20	The union of sets A and B is expressed as ? A) A/B B) A-B C) AxB D) AUB	D
21	How many rational and irrational numbers are possible between 0 and 1 ?	B

	A) 1 B) Infinite C) 0 D) Finite	
22	Empty set is a ? A) None of the above B) Invalid Set C) Finite Set D) Infinite Set	D
23	If R = {(1,1),(2,3),(4,5)}, then domain of the function is ? A) Dom R = {2,3,4,5} B) Dom R {1,1,4,5} C) Dom R {1,3,5} D) Dom R = {I,2,4}	D
24	Every set is a _____ of itself A) Compliment B) None of the above C) Proper subset D) Improper subset	D
25	A — B will contain elements in ? A) B not in A B) A not in B C) Both A and B D) Neither A nor B	B
26	If A = {0,2) and B = {1,3), then Cartesian product ? A) AxB = BxA B) None of the above C) is not possible D) AxB not equal BxA	D
27	If R = {(1,1),(2,3),(4,5)}, then Range of the function is ? A) Range R = {2,3,4,5} B) Range R {1,1,4,5} C) Range R = {I,3,5} D) Range R {1,2,5}	C
28	If A =[5,6,7] and B=[7,8,9]then A U B is equal to: A) [7,8,9] B) None of these C) [5,6,7,8,9] D) [5,6,7]	C
29	In a set – builder method, the null set is represented by A) { x : x = x} B) { x : x ≠ x} C) Φ D) { }	B
30	If A, B and C are any three sets, then A – (B ∪ C) is equal to A) (A - B) ∪ C B) (A - B) ∩ (A - C) C) (A - B) ∩ C D) (A - B) ∪ (A - C)	B
31	If A, B, C be three sets such that A ∪ B = A ∪ C and A ∩ B = A ∩ C, then. A) A = C B) B = C C) A = B = C D) A = B	B
32	If A, B and C are any three sets, then A × (B ∪ C) is equal to.	A

	A) (A × B) ∪ (A × C) B) (A ∪ B) × (A ∪ C) C) None of these D) (A × B) ∩ (A × C)	
33	A set consisting of a definite number of elements is called a A) Null set B) Singleton set C) Infinite set D) Finite set	D
34	If A ∩ B = B, then. A) A ⊂ B B) B ⊂ A C) A = ∅ D) B = ∅	B
35	If A and B are any two sets, then A ∩ (A ∪ B) is equal to A) A B) B C) A' D) B'	A
36	If A is any set, then A) None of these B) A ∪ A' = U C) A ∪ A' = ∅ D) A ∩ A' = U	D
37	In a class of 200 students, 70 played cricket, 60 played hockey and 80 played football. 30 played cricket and football, 30 played hockey and football, 40 played cricket and hockey. Find the maximum number of people playing all three games and also the minimum number of people playing at least one game. A) 200, 100 B) 30,120 C) 30,110 D) None of these	C
38	The set of intelligent students in a class is. A) Not a well defined collection B) A null set C) A finite set D) A singleton set	A
39	Out of 800 boys in a school, 224 played cricket, 240 played hockey and 336 played basketball. Of the total, 64 played both basketball and hockey; 80 played cricket and basketball and 40 played cricket and hockey; 24 played all the three games. The number of boys who did not play any game is. A) 160 B) 128 C) 216 D) 240	A
40	If n (A) = 115, n (B) = 326, n (A-B) = 47, then n (A U B) is equal to A) 370 B) 165 C) 373 D) None of these	C
41	A set is known by its _____ . A) Members B) Letters C) Elements D) Values	C
42	Which of the following sets are null sets: A) Set of all prime numbers between 15 and 19 B) {x: x < 5, x > 6} C) {x: |x |< -4, x belongs to N} D) B and C	D
43	If A = {1, 2, 3, 6, 11,18, 21}, B = {5, 7, 9} and N is the universal set, then A' U ((AU B) ? B') is equal to A) N-A B) B C) N D) A	C

44	If A = {1, 2} and B = {0, 1}, then A ´ B is
	    A) {(1, 0) (1, 1), (2, 0) (2, 1)}
	    B) {(1, 0), (2, 1)}
	    C) {(1, 1), (1, 2), (0, 1) (0, 2)}
	    D) None of these
		A

45	In a city 20 percent of the population travels by car, 50 percent travels by bus and 10 percent travels by both car and bus. Then persons travelling by car or bus is A) 80 percent B) 40 percent C) 60 percent D) 70 percent	C
46	Let A = {a, b, c} and B = {1, 2}. Consider a relation R defined from set A to set B. Then R is equal to set A) A B) B x A C) A x B D) B	C
47	A = {1, 3, 5, 7, 9} B = {2, 3, 5, 7} What is A ∩ B ? A) {3, 5, 7} B) {2, 3, 5, 7} C) {2, 3, 5, 7, 9} D) {1, 2, 3, 5, 7, 9}	A
48	Which is the correct set notation for A intersection B ? A) {12, 14, 15, 18, 21} B) {10, 11, 12, 14, 15, 18, 21} C) {10, 11, 13, 16, 17, 19, 20} D) {21}	D
49	What does the shaded portion of the Venn diagram represent? A) Band and Art B) Only Art C) Band or Art D) Neither	B
50	How many senior boys play football but do not wrestle?	C

The Venn diagram below shows the number of senior boys who play football or wrestle.

Football   **Wrestling**

18   9   12

104

A) 9
B) 12
C) 18
D) 104