INDIAN SCHOOL AL WADI AL KABIR
Department of Mathematics, 2021-2022
Holiday Assignment - CLASS: XI
TOPIC: Sets, Relations and Functions

Multiple Choice Questions

Q.1.	Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and n are, respectively							
	A	4,7	B	7,4	C	4,4	D	7, 7
Q.2.	The set $(A \cap B')' \cup (B \cap C)$ is equal to							
	A	$A' \cup B \cup C$	B	$A' \cup B$	C	$A' \cup C'$	D	$A' \cap B$
Q.3.	In a class of 60 students, 25 students play cricket and 20 students play tennis, and 10 students play both the games. Then, the number of students who play neither is							
	A	0	B	25	C	35	D	45
Q.4.	If $X = \{8^n - 7n - 1 \mid n \in N\}$ and $Y = \{49n - 49 \mid n \in N\}$, then							
	A	$X \subset Y$	B	$Y \subset X$	C	$X = Y$	D	$X \cap Y = \phi$
Q.5.	**Let n(A) = m, and n(B) = n. Then the total number of non-empty relations that can be defined from A to B is**							
	A	$\mathbf{m^n}$	B	$\mathbf{n^m - 1}$	C	**mn – 1**	D	$\mathbf{2^{mn} - 1}$
Q.6.	**If $[x]^2 - 5[x] + 6 = 0$, where [ ] denote the greatest integer function, then**							
	A	**x ∈ [3,4]**	B	**x∈ (2, 3]**	C	**x∈ [2, 3]**	D	**x ∈ [2, 4)**
Q.7.	Let $f(x) = \sqrt{1 + x^2}$, then							
	A	$f(xy) = f(x) \times f(y)$	B	$f(xy) \geq f(x) \times f(y)$	C	$f(xy) \leq f(x) \times f(y)$	D	None of these
Q.8.	Domain of $\sqrt{a^2 - x^2}$ $(a > 0)$ is							
	A	$(-a, a)$	B	$[-a, a]$	C	$[0, a]$	D	$(-a, 0]$
Q.9.	If f(x)= ax+ b, where a and b are integers and f (-1) = -5, f (3) = 3, then a and b are equal to							
	A	a = -3, b =-1	B	a = 2, b = -3	C	a = 0, b = 2	D	a = 2, b = 3

Q.10.	The domain of the function f given by $f(x) = \frac{x^2+2x+1}{x^2-x-6}$ is							
	A	$R-\{3,-2\}$	B	$R-\{-3,2\}$	C	$R-[3,-2]$	D	$R-(3,-2)$
	Descriptive							
Q.11.	Write the following sets in the roaster from (i) $A = \{x : x \in R, 2x + 11 = 15\}$ (ii) $B = \{x \mid x^2 = x, x \in R\}$ (iii) $C = \{x \mid x$ is a positive factor of a prime number $p\}$							
Q.12.	Let $T = \left\{x \mid \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x}\right\}$. Is T an empty set? Justify your answer.							
Q.13.	Out of 100 students; 15 passed in English, 12 passed in Mathematics, 8 in Science,6 in English and Mathematics, 7 in Mathematics and Science; 4 in English and Science; 4 in all the three. Find how many passed (i) in English and Mathematics but not in Science (ii) in Mathematics and Science but not in English (iii) in Mathematics only (iv) in more than one subject only							
Q.14.	In a survey of 200 students of a school, it was found that 120 study Mathematics, 90 study Physics and 70 study Chemistry, 40 study Mathematics and Physics, 30 study Physics and Chemistry, 50 study Chemistry and Mathematics and 20 none of these subjects. Find the number of students who study all the three subjects.							
Q.15.	In a town of 10,000 families it was found that 40% families buy newspaper A, 20% families buy newspaper B, 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 newspapers. Find (a) The number of families which buy newspaper A only. (b) The number of families which buy none of A, B and C.							
Q.16.	In a town of 840 persons, 450 persons read Hindi, 300 read English and 200 read both. Then the number of persons who read neither is							
Q.17.	If R = {(x, y)/ y = 2x + 7, where x∈ R and $-5 \leq x \leq 5$} is a relation. Then find the domain and range of R.							
Q.18.	If R = {(x, |x|) / x is a real number} is a relation. Then find domain and range							
Q.19.	**If f and g are real functions defined by f (x) = x^2 + 7 and g(x) = 3x + 5, find each of the following** (i) $f(3) + g(-5)$ (ii) $f(1/2) \times g(14)$							
Q.20.	If f(x)= y = $\frac{ax-b}{cx-a}$ then prove that f (y) = x							

Answers

1)B 2) B 3) B 4) A 5) D 6) D 7) C 8) B

9) B 10) A

11) $A = \{2\}$ $B = \{0, 1\}$ $C = \{1, p\}$

12) $T = \{10\}$

13) 2, 3, 3, 9

14) 20

15) 3300, 4000

16) 290

17) Domain = [-5, 5] Range = [-3, 17]

18) Domain = R, Range [0, ∞)

19) 6, $\frac{1363}{4}$

20)