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CLASS: XI | Chapter -2 – Relations & Functions | 29-06-2020

Q.1. A={(a,b) / b = 2a - 5} If (m,5) and (6,n) are the member of set A then m and n are respectively

	A	5,7	**B**	7, 5	**C**	2, 3	**D**	5, 3

Q.2. If $S_1 = \{1,2,3,....,20\}$, $S_2 = \{a,b,c,d\}$, $S_3 = \{b,d,e,f\}$. The number of elements of $(S_1 \times S_2) \cup (S_1 \times S_3)$ is

	A	100	**B**	120	**C**	140	**D**	40

Q.3. Let R be a relation in N defined by $R=\{(1 + x, 1 + x^2) / x \leq 5, x \in N\}$ which of the following is false ?

	A	R = {(2, 2), (3, 5), (4, 10), (5, 17), (6, 25)}	**B**	Domain of R = {2, 3, 4, 5, 6}	**C**	Range of R = {2, 5, 10, 17, 26}	**D**	B & C are true

Q.4. If A is the set of even natural numbers less then 8 and B is the set of prime numbers less than 7, then the number of relations from A to B is

	A	9^2	**B**	3^2	**C**	$2^9 - 1$	**D**	2^9

Q.5. Let R be a relation on N defind by $R = \{(x, y) / x + 2y = 8\}$ The domain of R is

	A	{2, 4, 8}	**B**	{2, 4, 6, 8}	**C**	{2, 4, 6}	**D**	{1, 2, 3, 4}

Q.6. Range of $f(x) = \dfrac{x^2 + 34x - 71}{x^2 + 2x - 7}$ is

	A	[5, 9]	**B**	(5, 9]	**C**	$(-\infty, 5] \cup [9, \infty)$	**D**	$(-\infty, 5) \cup (9, \infty)$

Q.7. If $[x]$ stands for the greatest integer function then the value of

$$\left[\frac{1}{5} + \frac{1}{1000}\right] + \left[\frac{1}{5} + \frac{2}{1000}\right] + ... + \left[\frac{1}{5} + \frac{999}{1000}\right] \text{ is}$$

	A	199	**B**	201	**C**	202	**D**	200

Q.8. If $f(2x + 3y, 2x - 3y) = 24xy$ then $f(x, y)$ is

	A	2xy	**B**	$2(x^2 - y^2)$	**C**	$(x^2 - y^2)$	**D**	None of these

Q.9.	Let $f(x) = \frac{x-[x]}{1+x-[x]}$ where $[x]$ denotes the greatest integer less than or equal to x then the range of f is							
	A	$[0, 1]$	**B**	$[0, \frac{1}{2})$	**C**	$[0, 1)$	**D**	$[0, \frac{1}{2}]$
Q.10	The domain of the function $f(x) = \frac{1}{\sqrt{\lvert x \rvert - x}}$ is							
	A	$(-\infty, \infty)$	**B**	$(0, \infty)$	**C**	$(-\infty, 0)$	**D**	$(-\infty, \infty) - \{0\}$
Q.11	Domain of $\sqrt{a^2 - x^2}$ $(a > 0)$ is							
	A	(-a, a)	**B**	[-a, a]	**C**	[0, a]	**D**	(-a, 0]
Q.12	If $[x]^2 - 5[x] + 6 = 0$, where $[\ .\ ]$ denote the greatest integer function, then							
	A	$x \in [3, 4]$	**B**	$x \in (2, 3]$	**C**	$x \in [2, 3]$	**D**	$x \in [2, 4)$
Q.13	If $f(x) = ax + b$, where a and b are integers, $f(-1) = -5$ and $f(3) = 3$, 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.14	The domain of the function f defined by $f(x) = \sqrt{4-x} + \frac{1}{\sqrt{x^2-1}}$ is equal to							
	A	$(-\infty, -1) \cup (1, 4]$	**B**	$(-\infty, -1] \cup (1, 4]$	**C**	$(-\infty, -1) \cup [1, 4]$	**D**	$(-\infty, -1) \cup [1, 4)$
Q.15	The domain and range of the real function f defined by $f(x) = \frac{4-x}{x-4}$ is given by							
	A	Domain = R, Range = $\{-1, 1\}$	**B**	Domain = R – {1}, Range = R	**C**	Domain = R – {4}, Range = $\{-1\}$	**D**	Domain = R – {– 4}, Range = $\{-1, 1\}$
Q16.	In each of the following cases, find a and b. (i) $(2a + b, a - b) = (8, 3)$ (ii) $\left(\frac{a}{4}, a-2b\right) = (0, 6 + b)$							
Q17.	Given R = $\{(x, y) : x, y \in W, x^2 + y^2 = 25\}$. Find the domain and Range of R.							

Q18.	If $R_1 = \{(x, y) \mid y = 2x + 7, \text{where } x \in \mathbf{R} \text{ and } -5 \le x \le 5\}$ is a relation. Then find the domain and Range of R_1.
Q19.	Is $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ a function? Justify. If this is described by the relation, $g(x) = \alpha x + \beta$, then what values should be assigned to α and β?
Q20.	Find the domain of each of the following functions given by i) $f(x) = \frac{1}{\sqrt{x+\lvert x\rvert}}$ ii) $f(x) = \frac{x^3 - x + 3}{x^2 - 1}$
Q21.	Find the range of the following functions given by (i) $f(x) = \frac{3}{2 - x^2}$ (ii) $f(x) = 1 - \lvert x - 2\rvert$
Q22.	If $f(x) = \frac{x-1}{x+1}$, then show that $f\left(\frac{1}{x}\right) = -f(x)$
Q23.	Find the domain and Range of the function $f(x) = \frac{1}{\sqrt{x-5}}$.
Q24.	If $f(x) = y = \frac{ax - b}{cx - a}$, then prove that $f(y) = x$

Answers	**1**	A	**2**	B	**3.**	A	**4**	D
	5	C	**6**	C	**7**	D	**8**	C
	9	B	**10**	C	**11**	B	**12**	D
	13	B	**14**	A	**15**	C	**16**	$a = \frac{11}{3}$ and $b = \frac{2}{3}$ $a = 0, b = -2.$
	17	D=R = {0, 3, 4, 5}	**18**	D=[-5, 5], R=[-3,17]	**19**	$\alpha = 2$ & $\beta = -1$	**20**	R^+ , R-{-1, 1}
	21	$[\frac{3}{2}, \infty)$, $(-\infty, 1]$	**22**	To prove	**23**	D=(5, ∞) R = R^+	**24**	To prove