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Dept. of Mathematics 2024 – 2025
Class XI – Work Sheet – Relations and Functions-1

1	The range of the relation R = $\{(x, x^2) : x$ is a prime number less than 15$\}$ is (a) {2, 3, 5, 7} (b) {2, 3, 5, 11} (c) {2, 3, 5, 7, 11, 13} (d) {4, 9, 25, 49, 121, 169}
2	If the ordered pairs $(a + 2, 4) = (5, 2a + b)$ are equal, then the value of a and b are (a) (2, –2) (b) {3, –2} (c) ϕ (d) {2, 3}
3	If there are 1024 relations from set A={ 1, 2, 3, 4, 5} to a set B, then the number of elements of B is: (a) 3 (b) 2 (c) 4 (d) 8
4	For two sets A and B, given $n(A \times B) = 6$ and three of the elements of $A \times B$ are (2, 5), (4, 6), (8, 6). Then the remaining elements are (a) (2, 6), (4, 5), (8, 5) (b) (2, 4), (4, 8), (5, 6) (c) (2, 6), (4, 5), (4, 8) (d) (2, 4), (4, 5), (6, 8)
5	The range of the Signum function defined by $f(x) = \begin{cases} \frac{\lvert x \rvert}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$ is (a) {–1, 1} (b) (–1, 1) (c) [–1, 1] (d) {–1, 0, 1}
6	If A and B are two sets having m and n elements, respectively and having p elements common. The number of possible relations which can be defined from A to B is (a) 2^{m+n} (b) 2^{m+n-p} (c) 2^{mn} (d) 2^{mn-p}
7	The domain of $f(x) = \sqrt{25 - x^2}$ is (a) R (b) (–5, 5) (c) [–5, 5] (d) $(-\infty, 5)$
8	If $n(A \cap B) = 5$, then $n((A \times B) \cap (B \times A))$ is equal to. (a) 5 (b) 20 (c) 25 (d) 16
9	The range of the function $f(x) = \frac{x}{1+x^2}$ is (a) $\left[-\frac{1}{2}, \frac{1}{2}\right]$ (b) $\left[\frac{1}{2}, \frac{1}{4}\right]$ (c) $\left(-\frac{1}{2}, \frac{1}{4}\right)$ (d) $\left(0, \frac{1}{2}\right)$

10	The range of the function $f(x) = x - [x]$ where $[x]$ is the greatest integer less than or equal to x is (a) $[0, 1)$ (b) $[0, 1]$ (c) $(0, 1)$ (d) $(0, 1]$
11	The set B is the range of a constant function. Then, $n(B)$ equals (a) 0 (b) 1 (c) 2 (d) 3
12	Find the domain and range of the relation R, where $R = \{(x + 1, x + 5)\}$, $x \in \{0, 1, 2, 3, 4, 5\}$ is (a) $D = \{0, 1, 2, 3, 4, 5\}$, $R = \{0, 1, 2, 3, 4, 5\}$ (b) $D = \{0, 1, 2, 3, 4, 5\}$, $R = \{5, 6, 7, 8, 9, 10\}$ (c) $D = \{1, 2, 3, 4, 5, 6\}$, $R = \{0,1, 2, 3, 4, 5\}$ (d) $D = \{1, 2, 3, 4, 5, 6\}$, $R = \{5, 6, 7, 8, 9, 10\}$
13	A and B are two sets having 4 and 6 elements respectively and having 3 elements in common. The number of relations that can be defined from A to B (a) 2^{21} (b) $2^{24} - 1$ (c) $2^{24} - 3$ (d) 2^6 (e) 2^{24}
14	There are 4096 relations from a set A to a set B. If the set A has 6 elements, then the number of elements in the set B is: (a) 32 (b) 2 (c) 128 (d) 1024
15	The range of the function $f(x) = \dfrac{3x + 5}{4x - 7}$ is: (a) R (b) $R - \{7\}$ (c) $R - \left\{\dfrac{1}{4}\right\}$ (d) $R - \left\{\dfrac{3}{4}\right\}$

- The answer will be discussed during the math lesson.

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