
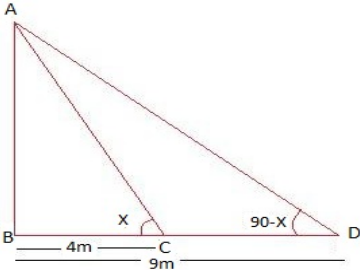


CBT CLASS XII MATHS APRIL 2025

GENERAL INSTRUCTION :

CHAPTER: RELATIONS AND FUNCTIONS

Sr.No	Question	Marks
	 <p><i>Sheela (S) and Harshita (H) are playing Lado at home during the Summer Vacation. While rolling the dice, Sheela's sister Rama observed and noted the possible outcomes of the throw every time belongs to set $\{1,2,3,4,5,6\}$. Let A be the set of players while B be the set of all possible outcomes. $A = \{S, H\}$, $B = \{1,2,3,4,5,6\}$</i> <i>Based on the above information, answer the following questions:</i></p>	
1	<p><i>Let $R: B \rightarrow B$ be defined by $R = \{(x, y): y \text{ is divisible by } x\}$ is</i></p> <p>(a) Reflexive and transitive but not symmetric. (b) Reflexive and symmetric and not transitive. (c) Not reflexive but symmetric and transitive. (d) Equivalence.</p>	1
2	<p><i>Rama wants to know the number of functions from A to B. How many number of functions are possible?</i></p> <p>(a) 6^2 (b) 2^6 (c) $6!$ (d) 2^{12}</p>	1
3	<p><i>Let R be a relation on B defined by $R = \{(1, 2), (2, 2), (1, 3), (3, 4), (3, 1), (4, 3), (5,5)\}$. Then R is</i></p> <p>(a) Symmetric (b) Reflexive (c) Transitive (d) None of these</p>	1
4	<p><i>Rama wants to know the number of relations possible from A to B. How many numbers of relations are possible?</i></p> <p>(a) 6^2 (b) 2^6 (c) $6!$ (d) 2^{12}</p>	1
	 <p><i>The angles of elevations of the top of a building AB from two points C and D at a distance of 4 m and 9 m respectively from the base of the building and in the same straight line with it are complementary. Look at the figure given and based on the above information answer the following:</i></p>	
5	<p><i>Measure of $\angle ACB =$</i></p> <p>(a) $\sin^{-1}(3/\sqrt{13})$ (b) $\sin^{-1}(2/\sqrt{13})$ (c) $\tan^{-1}(2/3)$ (d) $\sin^{-1}(\sqrt{13}/2)$</p>	1
6	<p><i>Measure of $\angle BAC =$</i></p> <p>(a) $\sin^{-1}(3/\sqrt{13})$ (b) $\sin^{-1}(2/\sqrt{13})$ (c) $\tan^{-1}(2/3)$ (d) $\sin^{-1}(\sqrt{13}/2)$</p>	1
7	<p><i>What is the height of AB</i></p> <p>(a) 4 m (b) 5 m (c) 6 m</p>	1

	(d) 8 m	
8	If $x = \tan^{-1}(3/2)$, then $\sec^2 x + \operatorname{cosec}^2 x =$ (a) 143/36 (b) 26/36 (c) 145/36 (d) 1	1
	Directions: (Q.9 – Q.10) Each of these questions contains two statements: Assertion (A) and Reason (R). Each of these questions also has four alternative choices, any one of which is the correct answer . You have to select one of the options (a) , (b) , (c) and (d) given below : (a) A is true , R is true and R is a correct explanation for A (b) A is true , R is true and R is not a correct explanation for Assertion (c) A is true and R is false (d) A is false and R is true	
9	Assertion: $R_1 = \{ (1,1),(2,2),(3,3), (1,2),(2,3) \}$ is a transitive relation Reason : A relation R on set A is transitive if aRb and $bRc \Rightarrow aRc$ a b c d	1
10	Assertion: Relation R in the set Z of integers given by $R = \{ (a, b) : 2 \text{ divides } a - b \}$ is an equivalence relation. Reason : Equivalence Class containing 0 is shown by $[0] = \{ \dots -4, -2, 0, 2, 4, \dots \}$ a b c d	1

Answer Key

Ans1	(a)
Feedback	Option a is correct, because Relation is Reflexive and transitive but not symmetric
Ans2	(a)
Feedback	Option a is Correct, because number of function from A to B is 6^2
Ans3	(d)
Feedback	Option d is correct, because in given relation R is not reflexive and neither symmetric nor transitive
Ans4	(d)
Feedback	Option d is correct, because relation is subset of $A \times B$, and number of subset of $A \times B$ are 2^{12}
Ans5	(a)
Feedback	Option a is correct, $\angle ACB = \sin^{-1}(3/\sqrt{13})$
Ans6	(b)
Feedback	Option b is correct, $\angle BAC = \sin^{-1}(2/\sqrt{13})$
Ans7	(c)
Feedback	Option c is correct, height of AB = 6 m
Ans8	(a)
Feedback	Option a is correct, $\sec^2 x + \operatorname{cosec}^2 x = 143/36$
Ans9	(d)
Feedback	Option (d) is correct, since Assertion is false, (Here relation is not transitive) and Reason is true
Ans10	(b)
Feedback	Correct option is (b), since R is equivalence relation and reason (equivalence class of zero is also correct) is also correct but reason is not explaining scalar product