CBT CLASS XII MATHS JUNE 2024

GENERAL INSTRUCTION :
CHAPTER: RELATIONS AND FUNCTIONS

Sr.No	Question	Marks
	If a function f:X→Y defined as f(x) = y is one-one and onto, then we can define a unique function g:Y→X such that g(y) = x, where x ∈ X and y = f(x), y ∈ Y. Further g is called the inverse of function f. The domain of sine function is R and function sin:R→R is neither one-one nor onto. The following graph shows sine function $y = \sin x$ Let sine function defined set A to[-1,1] such that inverse of sine function exists, i.e, $\sin^{-1}x$ is defined from [-1,1] to A on the basis of the above information, answer the following questions	
1	If A is the interval other than principal value branch so which one is correct (a) [0,π] (b) [π/2 ,π] (c) [π/2 ,3π/2] (d) [-π/2 ,π/2]	1
2	If $\sin^{-1}x$ is defined from [-1,1] to its principal value branch than value of $\sin^{-1}(-1/2)$ is (a) π/3 (b)-π/3 (c) -π/6 (d) π/6	1
3	If $\sin^{-1}x$ is defined from [-1,1] to its principal value branch than value of $\sin^{-1}(-1/2) - \sin(1)$ is (a) -2π/3 (b) 2π/3 (c) -π/3 (d) π/3	1
4	Domain of $2\sin^{-1}(1-x)$ (a) [0,1] (b) [0,2] (c) [-1,0] (d) [-1,1]	1
	Three students Ram ,Mohan, and Ankit go to a shop to buy stationary. Ram purchases 2 dozen notebooks, 1 dozen pens, and 4 pencils, Mohan purchases 1 dozen notebooks, 6 pens, and 8 pencils and Ankit purchases 6 notebooks, 4 pens, and 6 pencils. A notebook cost Rs 15, a pen cost Rs 4.5 and a pencil cost Rs 1.5 Let A and B be the matrices representing the number of items purchased by these three students and the prices of the items respectively On the basis of above information, answer the following questions:	
5	Order of Matrix A (a) 3 X 3 (b) 1 X 3 (c) 3 X 1 (d) 2 X 3	1
6	Order of Matrix B (a) 3 X 3 (b) 1 X 3 (c) 3 X 1 (d) 2 X 3	1

7	**Order of matrix AB is** **(a) 3 X 2** **(b) 3 X 1** **(c) 1 X 3** **(d) 2 X 3**	1
8	**Total amount of bill by all the three students** **(a) Rs 750** **(b) Rs 752** **(c) Rs 754** **(d) Rs 756**	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 (A): The simplest form of** $\tan^{-1}\left(\sqrt{\dfrac{1-cosx}{1+cosx}}\right)$ **is** $\dfrac{x}{2}$ **Reason (R):** $\tan^{-1}(\tan\theta) = \theta$ **, if** $\theta \in (\dfrac{-\pi}{2},\dfrac{\pi}{2})$ **a** **b** **c** **d**	1
10	**Let A and B be two square matrices of same order** **Assertion: A'BA is symmetric matrix if B is symmetric** **Reason : A'BA is symmetric matrix if B is skew symmetric** **a** **b** **c** **d**	1

Answer Key

Ans1	**(c)**
Feedback	*Option c is correct, Since interval other than principal value branch are [-3π/2,-π/2] [π/2,3π/2], [3π/2,5π/2] etc*
Ans2	**(c)**
Feedback	*Option c is Correct, Since principal value of sin⁻¹(-1/2) is -π/6*
Ans3	**(a)**
Feedback	*Option a is correct, Since principal value of sin⁻¹(-1/2) -sin⁻¹(1) = (-π/6)-(π/2) = -2π/3*
Ans4	**(b)**
Feedback	*Option b is correct, Since domain of sin invers function is [-11] so domain of sin⁻¹(1-x) is [0,2]*
Ans5	*(a)*
Feedback	*Option a is correct, Since order of A have three rows and three columns i.e.3 X 3*
Ans6	*(c)*
Feedback	*Option c is correct, Since order of B have three rows and one column i.e. 3 X 1*
Ans7	**(b)**
Feedback	*Option b is correct, Since order of A is 3 X 3 and order of B is 3 X 1 so order of AB is 3 X 1*
Ans8	**(d)**
Feedback	*Option d is correct, Since sum of entries of product of matrices AB are 420+219+117 = Rs.756*
Ans9	*(a)*
Feedback	*Option (a) is correct, since A is true , R is true and R is a correct explanation for A*
Ans10	*(b)*
Feedback	*Correct option is (b), since A is true , R is true but R is not a correct explanation for A*