



CBT CLASS XII MATHS JULY-2024

GENERAL INSTRUCTION :

CHAPTER: MATRICES AND DETERMINANTS

Sr.No	Question	Marks																
	<p>Case Study 1</p> <p>To promote the usage of house toilets in villages especially for women, an organization tried to generate awareness among the villagers through (i) house calls (ii) letters and (iii) announcements The cost for each mode per attempt is (i) Rs 50 (ii) Rs 20 (iii)Rs40 respectively The number of attempts made in the villages X, Y and Z are given below:</p> <table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th></th> <th>(i)</th> <th>(ii)</th> <th>(iii)</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>400</td> <td>300</td> <td>100</td> </tr> <tr> <td>Y</td> <td>300</td> <td>250</td> <td>75</td> </tr> <tr> <td>Z</td> <td>500</td> <td>400</td> <td>150</td> </tr> </tbody> </table>  <p>Also the chance of making of toilets corresponding to one attempt of given modes is: (i) 2% (ii) 4% (iii) 20% Let A, B, C be the cost incurred by organization in three villages respectively. Based on the above information answer the following questions</p>		(i)	(ii)	(iii)	X	400	300	100	Y	300	250	75	Z	500	400	150	
	(i)	(ii)	(iii)															
X	400	300	100															
Y	300	250	75															
Z	500	400	150															
1	<p>What is the cost incurred by organization in three village</p> <p>(a) A = 40000, B= 23000, C= 39000 (b) A = 30000, B= 24000, C= 39000 (c) A = 30000, B= 23000, C= 39000 (d) A = 30000, B= 23000, C= 38000</p>	1																
2	<p>Find the number of toilets expected in villagers X,Y,Z after the promotion campaign is</p> <p>(a) Number of Toilets expected in Villages X = 40 ,Y = 31 ,Z = 56 (b) Number of Toilets expected in Villages X = 31 ,Y = 41 ,Z = 56 (c) Number of Toilets expected in Villages X = 41 ,Y = 56 ,Z = 31 (d) Number of Toilets expected in Villages X = 31,Y = 41 ,Z = 56</p>	1																
3	<p>What is total amount spent by the organization in all three villages X, Y and Z</p> <p>(a) 94000 (b) 92000 (c) 93000 (d) 90000</p>	1																
4	<p>What are the total number of toilets expected after promotion campaign?</p> <p>(a) 157 (b) 147 (c) 137 (d) 127</p>	1																
	<p>Case Study 2</p> <p>A scholarship is a sum of money provided to a student to help him or her pay for education. Some students are granted scholarships based on their academic achievements, while others are rewarded based on their financial needs.</p>  <p>Every year a school offers scholarships to girl children and meritorious achievers based on certain criteria. In the session 2022-23,</p>																	

	the school offered monthly scholarship of Rs 3000 each to some girl students and Rs 4000 each to meritorious achievers in academics as well as sports. In all, 50 students were given the scholarships and monthly expenditure incurred by the school on scholarships was Rs 1,80,000. Based on the above information, answer the following questions:	
5	Express the given information, in Form of matrix representation (a) $[3000 \ 4000 \ 1 \ 1][x \ y] = [180000 \ 50]$ (b) $[4000 \ 3000 \ 1 \ 1][x \ y] = [180000 \ 50]$ (c) $[3000 \ 4000 \ 2 \ 1][x \ y] = [180000 \ 50]$ (d) $[3000 \ 4000 \ 2 \ 2][x \ y] = [180000 \ 50]$	1
6	How many girl students got scholarship (a) 30 (b) 20 (c) 10 (d) 40	1
7	How many meritorious students got scholarship (a) 10 (b) 40 (c) 20 (d) 30	1
8	Had the amount of scholarship given to each girl child and meritorious students been interchanged what would be the monthly expenditure incurred by the school ? (a) 190000 (b) 160000 (c) 150000 (d) 170000	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: Every scalar matrix is a diagonal matrix. Reason: In a diagonal matrix, all the diagonal elements are 0.	1
10	Assertion: If $A = [1 \ 0 \ 1 \ 0 \ 1 \ 2 \ 0 \ 0 \ 4]$ then $ 3A = 9 A $ Reason: If A is square matrix of order n, then $ kA = k^n A $	1

Answer Key

Ans1	(c)
Feedback	Option (c) is correct, by matrix multiplication we get $A = 30000, B = 23000, C = 39000$
Ans2	(a)
Feedback	Option (a) is correct, by matrix multiplication we get Number of Toilets expected in Villages $X = 40, Y = 31$ $Z = 56$
Ans3	(b)
Feedback	Option (b) is correct, total amount = $30000 + 23000 + 39000 = 92000$
Ans4	(d)
Feedback	Option (d) is correct, total number of toilets expected after promotion campaign = $40 + 31 + 56 = 127$
Ans5	(a)
Feedback	Option (a) is correct matrix representation of linear equation is $AX = B$
Ans6	(b)
Feedback	Option (b) is correct, by solving equations $3000x + 4000y = 180000$ and $x + y = 50$ using $X = A^{-1} B$ we get $x = 20$ which represent girl students
Ans7	(d)
Feedback	Option (d) is correct, by solving equations $3000x + 4000y = 180000$ and $x + y = 50$ using $X = A^{-1} B$ we get $y = 30$ which represent meritorious students
Ans8	(d)
Feedback	Option (d) is correct, the amount of scholarship given to each girl child and meritorious students been interchanged then school spent $3000 \times 30 + 4000 \times 20 = \text{Rs } 170000$

Ans9	(c)
Feedback	<i>Option (c) is correct, is true , A is true and R is false</i>
Ans10	(d)
Feedback	<i>Option (d) is correct, A is false and R is true</i>