

**SIR CV RAMAN COACHING CENTRE IDAPPADI ,SALEM-637101**

**XII - MATHS UNIT - I- MODEL EXAMINATION**

**APPLICATIONS OF MATRICES AND DETERMINANTS**

**TOTAL MARK : 25 M**

**DATE : 05.05.2024**

**ANSWER ANY FIVE QUESTIONS ( 5 x 5 =- 25 m )**

1 .In a competitive examination, one mark is awarded for every correct answer while  $\frac{1}{4}$  mark is deducted for every wrong answer. A student answered 100 questions and got 80 marks. How many questions did he answer correctly ? (Use Cramer's rule to solve the problem)

2. A chemist has one solution which is 50% acid and another solution which is 25% acid. How much each should be mixed to make 10 litres of a 40% acid solution ? (Use Cramer's rule to solve the problem)

3. A fish tank can be filled in 10 minutes using both pumps A and B simultaneously. However, pump B can pump water in or out at the same rate. If pump B is inadvertently run in reverse, then the tank will be filled in 30 minutes. How long would it take each pump to fill the tank by itself ? (Use Cramer's rule to solve the problem)

4. A family of 3 people went out for dinner in a restaurant. The cost of two dosai, three idlies and two vadais is `Rs 150. The cost of the two dosai, two idlies and four vadais is Rs ` 200. The cost of five dosai, four idlies and two vadais is ` Rs 250. The family has ` Rs 350 in hand and they ate 3 dosai and six idlies and six vadais. Will they be able to manage to pay the bill within the amount they had ?

5. An amount of `Rs 65,000 is invested in three bonds at the rates of 8 %,6 % and 9% per annum respectively. The total annual income is `Rs 4,800. The income from the third bond is `Rs 600 more than that from the second bond. Determine the price of each bond. (Use Gaussian elimination method).

6. Test for consistency and if possible, solve the following systems of equations by rank method.

$$3x + y + z + 2, x - 3y + 2z = 1, 7x - y + 4z = 5$$

7. A boy is walking along the path  $y = ax^2 + b x + C$  through the points  $(-6, 8)$ ,  $(-2, -12)$ , and  $(3, 8)$ . He wants to meet his friend at  $P(7, 60)$ . Will he meet his friend?

(Use Gaussian elimination method.)

8. Solve the following system of linear equations by matrix inversion method

$$2x + 3y - z = 9, x + y + z = 9, 3x - y - z = -1$$

## **PREPARED BY**

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**"ALL THE BEST"**