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Questions:

Answer all the questions:

1. The price of 3 Business Mathematics books, 2 Accountancy books and one Commerce book is Rs. 840. The price of 2 Business Mathematics books, one Accountancy book and one Commerce book is Rs. 570. The price of one Business Mathematics book, one Accountancy book and 2 Commerce books is Rs. 630. Find the cost of each book by using Cramer's rule.

2. In a market survey three commodities A, B and C were considered. In finding out the index number some fixed weights were assigned to the three varieties in each of the commodities. The table below provides the information regarding the consumption of three commodities according to the three varieties and also the total weight received by the commodity

Commodity Variety	Variety			Total weight
	I	II	III	
A	1	2	3	11
B	2	4	5	21
C	3	5	6	27

Find the weights assigned to the three varieties by using Cramer's Rule.

3. Two types of soaps A and B are in the market. Their present market shares are 15% for A and 85% for B. Of those who bought A the previous year, 65% continue to buy it again while 35% switch over to B. Of those who bought B the previous year, 55% buy it again and 45% switch over to A. Find their market shares after one year and when is the equilibrium reached?

Answer all the questions:

4. Solve the equations 2x + 3y = 7, 3x + 5y = 9 by Cramer's rule.

5. The total cost of 11 pencils and 3 erasers is Rs. 64 and the total cost of 8 pencils and 3 erasers is Rs. 49. Find the cost of each pencil and each eraser by Cramer's rule.

6. A commodity was produced by using 3 units of labour and 2 units of capital, the total cost is Rs 62. If the commodity had been produced by using 4 units of labour and one unit of capital, the cost is Rs 56. What is the cost per unit of labour and capital? (Use determinant method).

7. Parithi is either sad (S) or happy (H) each day. If he is happy in one day, he is sad on the next day by four times out of five. If he is sad on one day, he is happy on the next day by two times out of three. Over a long run, what are the chances that Parithi is happy on any given day?

8. The subscription department of a magazine sends out a letter to a large mailing list inviting subscriptions for the magazine. Some of the people receiving this letter already subscribe to the magazine while others do not. From this mailing list, 45% of those who already subscribe will subscribe again while 30% of those who do not now subscribe will subscribe. On the last letter, it was found that 40% of those receiving it ordered a subscription. What percent of those receiving the current letter can be expected to order a subscription?

9. Solve the following equation by using Cramer's rule
5x + 3y = 17; 3x + 7y = 31

Choose the best answer:

10. Which of the following is not an elementary transformation?
(a) $R_i \leftrightarrow R_j$ (b) $R_i \rightarrow 2R_i + 2C_j$ (c) $R_i \rightarrow 2R_i - 4R_j$ (d) $C_i \rightarrow C_i + 5C_j$

11. If $\rho(A) = \rho(A, B)$ then the system is _____.
(a) Consistent and has infinitely many solutions (b) Consistent and has a unique solution (c) Consistent (d) inconsistent

12. If $\rho(A) = \rho(A, B)$ the number of unknowns, then the system is_____.
(a) Consistent and has infinitely many solutions (b) Consistent and has a unique solution (c) consistent (d) inconsistent

13. If $\rho(A) \neq \rho(A, B)$, then the system is _____.
(a) Consistent and has infinitely many solutions (b) Consistent and has a unique solution (c) inconsistent (d) consistent

14. In a transition probability matrix, all the entries are greater than or equal to _____.
(a) 2 (b) 1 (c) 0 (d) 3

15. For the system of equations x + 2y + 3z = 1, 2x + y + 3z = 2, 5x + 5y + 9z = 4 _____.
(a) there is only one solution (b) there exists infinitely many solutions (c) there is no solution (d) None of these

16. The system of linear equations x + y + z = 2, 2x + y − z = 3, 3x + 2y + k = 4 has unique solution, if k is not equal to _____.
(a) 4 (b) 0 (c) -4 (d) 1

17. Cramer's rule is applicable only to get an unique solution when _____.
(a) $\triangle_z \neq 0$ (b) $\triangle_x \neq 0$ (c) $\triangle \neq 0$ (d) $\triangle_y \neq 0$

18. $|A_{n\times n}|$ = 3 $|adjA|$ = 243 then the value n is _____.
(a) 4 (b) 5 (c) 6 (d) 7

19. Rank of a null matrix is _____.
(a) 0 (b) -1 (c) ∞ (d) 1