EVERWIN MATRIC. HR. SEC. SCHOOL

STD: XII Holiday Material

Business Maths and Statistics

Note: Based on the given material, a special test will be conducted in the 1st week of June.

I. Answer the following:

1. Find the rank of the matrix $A=\begin{pmatrix}5 & 3 & 14 & 4\\ 0 & 1 & 2 & 1\\ 1 & -1 & 2 & 0\end{pmatrix}$
2. Find k if the equations x+y+z=3, x+3y+2z=6, x+5y+3z=k are inconsistent.
3. Show that the equations x-3y-8z=-10, 3x+y-4z=0, 2x+5y+6z=13 are consistent and have infinite sets of solution.
4. A woman invested different amounts at 8%, $8\frac{3}{4}$% and 9%, all at simple interest. Altogether she invested Rs.40,000 and earns Rs.3,455 per year. How much does she have invested at each rate if she has Rs.4,000 more invested at 9% than at 8%? Solve by using matrices.
5. Solve by Cramer's rule: x+y=2, y+z=6, z+x=4
6. The cost of 2kg of wheat and 1kg of sugar is Rs.7. The cost of 1kg wheat and 1kg of rice is Rs.7. The cost of 3kg of wheat, 2kg of sugar and 1kg of rice is Rs.17. Find the cost of each per kg., using matrix method.
7. A company produces three products everyday. The total production on a certain day is 45 tons. It is found that the production of the third product exceeds the production of the first product by 8 tons while the total production of the first and third product is twice the production of second product. Determine the production level of each product by using Cramer's rule.
8. Two products A and B currently share the market with shares 60% and 40% each respectively. Each week some brand switching takes place. Of those who bought A the previous week, 70% buy it again whereas 30% switch over to B. Of those who bought B the previous week, 80% buy it again whereas 20% switch over to A. Find their shares after one week and after two weeks. If the price war continues, when is the equilibrium reached?
9. A new transit system has just gone into operation in a city. Of those who use the transit system this year, 10% will switch over to using their own car next year and 90% will continue to use the transit system. Of those who use their cars this year, 80% will continue to use their cars next year and 20% will switch over to the transit system Suppose the population of the city remains constant and that 50% of the commuters use the transit system and 50% of the commuters use their own car this year.
   i) What percent of commuters will be using the transit system after one year?
   ii) What percent of commuters will be using the transit system in the long run?
10. Two newspapers A and B are published in a city. 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 two years.

Practice Ch-1 (Ex:1.1 to Ex:1.3 fully), Ch-2 Ex:2.1 fully