

## B.COM: SEMESTER II

### Paper BC 2.3: BUSINESS MATHEMATICS AND STATISTICS

- Q 1. A housewife went for shopping to buy 3 kg of butter, 1 kg of cheese and 5 kg of sugar. In her local stores these were priced at Rs. 80, Rs. 60, Rs. 20 per kg respectively, but at the super market in a nearby town they could be bought at Rs. 75, Rs. 54 and Rs. 14. How much would she save by going to town if her us fare for the return journey was Rs. 25?
- Q 2. In a certain city there are 60 colleges and 300 schools. Each school and college has 18 peons, 5 clerks and 1 cashier. Each college, in addition, has 1 section officer and 1 librarian. The monthly salary of each of them is as follows:  
Peon-Rs. 4000, Clerk- Rs. 6000, Cashier-Rs. 7000, Section officer- Rs. 8000 and Librarian-Rs, 9000. Using matrix notation, find
- The total number of post of each kind in schools and colleges taken together,
  - The total monthly salary bill of all the schools and colleges taken together.
- Q 3. A firm produces two products  $P_1$  and  $P_2$ , passing through two machines  $M_1$  and  $M_2$  before completion.  $M_1$  can produce either 10 units of  $P_1$  or 15 units of  $P_2$  per hour.  $M_2$  can produce 15 units of either products per hour. Find daily production of  $P_1$  and  $P_2$ , if time available is 12 hours of machine  $M_1$  and 10 hours of  $M_2$  per day using matrix inversion.
- Q 4. One unit of commodity A is produced by combining 1 unit of land, 2 units of labour and 5 units of capital. One unit of B is produced by 2 units of land, 3 units of labour and 1 unit of capital. One unit of C is produced by 3 units of land, 1 units of labour and 2 units of capital, If the price of A,B,C are Rs. 27, Rs. 16 and Rs. 19 respectively, find the rent R, wages W and rate of interest I, by using determinant method.
- Q 5. For the demand curve  $aQ+bP-K=0$ , where a,b and K are positive constants, determine point elasticity of demand when marginal revenue is zero.
- Q 6. The demand x as a function of income y is given by  $30x = 10 + 2y$ . Obtain the expression for the income elasticity of demand and its value when  $y=250$ .
- Q 7. A person deposited Rs. 15,000 in a bank for 3 years offering interest at the rate of 8% compounded half yearly during first year, at the rate of 12% compounded quarterly during

second year and at 10% compounded continuously during third year. Find his balance after three years.

Q 8. Find the amount to which Rs. 500 will accumulate at the rate of 10% per annum compounded quarterly for 12 years.

Q 9. Distinguish between the nominal and effective rate of interest. Also establish the relationship between nominal and effective rate of interest, when compounded  $n$  times a year and when compounded continuously.

Q 10. The total cost  $C(x)$  of a firm is  $C(x) = 1500 + 30x + x^2$ , where  $x$  is the output. Determine:

- (i) The average cost,
- (ii) The marginal cost,
- (iii) The marginal cost when 20 units are produced,
- (iv) The actual cost of producing twenty-first unit.