

Total No. of Questions : 5]

SEAT No. :

P2152

[Total No. of Pages : 3

[5804]-105

F.Y. B.B.A. (I.B.)

105 : BUSINESS MATHEMATICS

(2019 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Use of statistical tables and calculator is allowed.
- 4) Symbols have their usual meanings.

Q1) A) Fill in the blanks :

[5 × 2 = 10]

- a) If $x : y = 6 : 8$ and $x = 42$, then $y = \underline{\hspace{2cm}}$.
- | | |
|---------|----------|
| i) 40 | ii) 48 |
| iii) 56 | iv) None |
- b) Fourth proportional to 4, 6, 8 is .
- | | |
|---------|----------|
| i) 10 | ii) 12 |
| iii) 14 | iv) None |
- c) A man sold 12 pens for the cost price of 15 pens then profit is %.
- | | |
|---------|----------|
| i) 25 | ii) 50 |
| iii) 40 | iv) None |
- d) 12% of 800 = .
- | | |
|---------|----------|
| i) 90 | ii) 80 |
| iii) 95 | iv) None |
- e) ${}^{15}C_4 = \underline{\hspace{2cm}}$.
- | | |
|-----------|----------|
| i) 1360 | ii) 1365 |
| iii) 1400 | iv) None |

P.T.O.

B) State whether the following statements are true or false : [3 × 2 = 6]

a) $1 + 2 + 3 + \dots + n = \frac{n(n-1)}{2}$.

b) If number of rows of matrix A is not equal to number of columns of matrix B then we can find the product of two matrices A and B.

c) Objective function may be either maximize or minimize.

Q2) Attempt any four of the following : [4 × 4 = 16]

a) Find n if ${}^n P_4 = 18[{}^{(n-1)} P_2]$.

b) Evaluate the following determinant $\begin{vmatrix} 4 & -3 & 2 \\ 1 & 2 & 1 \\ 3 & 1 & -2 \end{vmatrix}$

c) Find the simple interest on Rs. 2,000 at 6% p.a. for 5 months.

d) The population of a city according to 1971 census was 84,500 and it rose to 1,10,000 in 1981. Find the percentage increase in the population.

e) A commission agent gets 12% commission upto a sale of Rs. 30,000/- and 15% on the sales exceeding Rs. 30,000/-. In a month, his sales are Rs. 67,000/- find his commission.

f) Find the values of x , y and z if $\begin{vmatrix} 2x-1 & 3 \\ 4 & 2 \end{vmatrix} + \begin{vmatrix} 7 & 2 \\ 1 & y+3 \end{vmatrix} = \begin{vmatrix} 10 & 5 \\ 5 & 9 \\ 11 & 1 \end{vmatrix}$.

Q3) Attempt any four of the following : [4 × 4 = 16]

a) Define the following terms :

i) Decision variables

ii) Optimum solution

b) The following data relates to the marks of a group of students :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of Students	15	38	65	84	100

How many students got marks more than 30?

- c) Ratio of two numbers is 3 : 5 and the sum of the numbers is 232, find the bigger number.
- d) Find the compound interest on Rs. 5,000 at 4% p.a. for 5 years.
- e) Find the adjoint of the matrix $A = \begin{bmatrix} 4 & 3 \\ 7 & 5 \end{bmatrix}$.
- f) The price of a mobile hand set is Rs. 20,000. An agent charges commission at 4%. If he earns Rs. 40,000. Find the number of mobile sets sold by him.

Q4) Attempt any four of the following :

[4 × 4 = 16]

- a) If ${}^n C_8 = {}^n C_6$, find ${}^n C_3$.
- b) If 8, y and 50 are in continued proportion, find y.
- c) Define the following terms :
- Diagonal matrix
 - Upper Triangular matrix
- d) Solve the following LPP by graphical method

$$\text{Maximize } Z = 3x_1 + 2x_2$$

$$\text{Subject to } 2x_1 + x_2 \leq 2$$

$$3x_1 + 4x_2 \geq 12$$

$$x_1 \geq 0, x_2 \geq 0$$

e) Find the value of x if $\begin{vmatrix} 5 & 5 & x \\ x & 5 & 5 \\ 5 & 5 & 4 \end{vmatrix} = 0$.

- f) What is the difference between simple interest and compound interest at 10% p.a. on Rs. 1,500 for 2 years.

Q5) Attempt any one of the following :

[1 × 6 = 6]

a) If $A = \begin{bmatrix} 2 & 3 \\ -1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$ verify that $|AB| = |A||B|$.

- b) If x varies directly as y and inversely as z and x = 12 when y = 9 and z = 16, find y when x = 9 and z = 24.

