

Total No. of Questions : 3]

SEAT No. :

PA-1992

[Total No. of Pages : 3

[5955]-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 table and calculator is allowed.*
- 4) *Symbols have their usual meanings.*

Q1) A) Fill in the blanks:

[5×2=10]

- a) If a, b, c are in continued proportion then _____.
- | | |
|-----------------|----------------|
| i) $a^2 = bc$ | ii) $b^2 = ac$ |
| iii) $c^2 = ab$ | iv) $a = bc$ |
- b) 4:5 can be expressed into percentage as _____.
- | | |
|---------|--------|
| i) 80 | ii) 85 |
| iii) 90 | iv) 95 |
- c) If the L.P.P, the conditions, limitations are called as _____.
- | | |
|-----------------------|------------------------|
| i) Decision variables | ii) Objective function |
| iii) Constraints | iv) None of the above |
- d) If $x : y = 3 : 7$ and $x = 21$ then $y =$ _____.
- | | |
|---------|--------|
| i) 35 | ii) 28 |
| iii) 14 | iv) 49 |
- e) If all the elements in the matrix are equal to zero then it is called _____ matrix.
- | | |
|-------------|--------------|
| i) Identity | ii) Zero |
| iii) Scalar | iv) Diagonal |

P.T.O.

- B) State whether the following statements are True or False. [3×2=6]
- For the selection of objects combination is required.
 - A non-singular matrix can possess inverse.
 - If selling price is more than cost price then loss is incurred.

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

- An article is sold at 25% profit. Find the ratio of cost price to selling price.
- A car travels 81 km in 4.5 litres of petrol. How far will it travel by 20 litres of petrol?
- Find the simple interest on Rs. 1,000 at 6% p.a. for 5 months?
- Find the value of x if $\begin{bmatrix} x & 15 \\ 4 & 12 \end{bmatrix}$ is a singular matrix.
- If ${}^n P_r = 240$, ${}^n C_r = 120$, find n and r .
- If 135 litres of milk mixed with water the ratio of milk to water is 7:2. How much water to be added so that ratio of milk to water becomes 5:2?

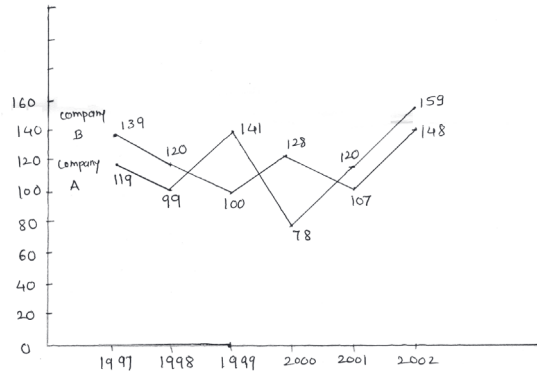
Q3) Attempt any four of the following: [4×4=16]

- A sum of Rs. 3,000 amounts to Rs. 3,960 at 8% p.a. simple interest in a certain period. Find period.
- Write a note on fundamental principle of counting.
- If ${}^n C_6 = {}^n C_4$ then find ${}^n C_2$.
- If $A = \begin{bmatrix} -1 & 2 \\ 5 & 1 \end{bmatrix}$, find matrix x such that $2A + 3x = \begin{bmatrix} 4 & 16 \\ -5 & 17 \end{bmatrix}$.
- If $A:B = 3:4$, $B:C = 2:5$, find $A:B:C$.
- Find the number whose 14% is 126.

Q4) Attempt any four of the following: [4×4=16]

- A car was bought for Rs. 86,000 and sold for Rs. 92,000 through a broker who charges 2% commission on purchase and 3% on sales. Find the total gain on transactions.
- Explain Feasible solution and optimal solution of the L.P.P.
- Find the value of x if ${}^{10}C_5 + {}^{10}C_6 + {}^{11}C_7 = {}^{12}C_x$
- Two numbers are in the ratio 7:8 and their sum is 195. Find the numbers.

- e) What was the day of week on 1st January 1987, If it was Wednesday on 1st January 1986?
- f) The following line graph shows number of vehicles manufactured by two companies A & B over the years (number in Thousands).



- i) What is the difference between number of vehicles manufactured by company B in 2000 & 2001?
- ii) What is the average number of vehicles manufactured by company A over the given period?

Q5) Attempt any one of the following:

[1×6=6]

- a) Solve the following L.P.P. by graphical method:

$$\text{Minimize } Z = 30x + 50y$$

subject to

$$20x + 15y \geq 1800$$

$$10x + 20y \geq 1700$$

$$40x + 10y \geq 1600$$

$$x, y \geq 0$$

- b) Find the inverse of

$$A = \begin{bmatrix} 8 & 2 & 4 \\ 3 & 5 & 5 \\ 5 & 1 & 3 \end{bmatrix}$$

