[5953]-105
First Year B.B.A.
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 a, b, c, d are in proportion, then _____.

        i)   ad = bc   ii)   ac = bd

        iii)   ab = cd   iv)   None of the above

     b)   If $x : y = 5:7$ and $x = 40$ then $y =$ _____.

        i)   49   ii)   56

        iii)   63   iv)   72

     c)   7:8 is expressed into percentage as _____.

        i)   85.5%   ii)   86.5%

        iii)   87.5%   iv)   89.5%

     d)   If cost price is more than selling price then loss = _____.

        i)   Selling price – cost price

        ii)   Selling price + cost price

        iii)   Cost price – selling price

        iv)   None of the above

P.T.O.

e) The value of $^5C_1$ = _____ .

i) 1   ii) 5

iii) 4   iv) 15

B) State whether the following statement are True or False.   **[3×2=6]**

i) Only a non-singular matrix can possess inverse.

ii) For the selection of objects p ermutation is required.

iii) In the L.P.P. decision variables are the unknowns to be found out.

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

a) If the ratio of two numbers is 4:7 and the smaller number is 24. Find the bigger number.

b) Find the simple interest on Rs. 2500 for 3 years at 5% p.a.

c) If $\begin{bmatrix} x & 3 \\ 8 & 6 \end{bmatrix}$ is a singular matrix then find the value of x.

d) Explain constraints and objective function of the L.P.P.

e) How many four-digit numbers can be formed using the digits 1,2,3,4,5 if repetition of digits is not allowed?

f) The average age of 7 family members is 75 years. But average age of 6 of them is 74 years 6 months. Find the age of the 7th family member.

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

a) If $^nP_r = 3024$ and $^nC_r = 126$ then find n.

b) If $A = \begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 1 \\ 3 & 2 \end{bmatrix}$ find 3A –2B.

c) If was sunday on 1st January 2006, what will be the day on 1st January 2023?

d) An agent receives Rs. 800 as a commission on the sales worth Rs. 10,000. Find the rate of commission.

e) If A:B = 4:3 and B:C = 6:7, find A:B:C.

f) Find the amount of Rs. 4,500 at 12% p.a. in 4 years, compounded half yearly.

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

a) Show that the matrix $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ satisfies the equation $A^2 - 4A + I = 0$

b) A committee of 3 persons is to be formed from 5 men & 4 women so as to include atleast one man and atleast one woman. In how many ways can this be done?

c) A camera when sold at Rs. 1674 resulted into loss of 7%, then calculate cost price.

d) Explain symmetric and skew-symmetric matrix.

e) Find the amount on the principal of Rs. 4000 at the rate of 11.5% p.a. in 10 years?

f) The following data is related to different shops which sold books:

Shops	Total Boks	% of Sold Books	% of Novels out of total total books	% of story Books out of Total Books
A	14,000	70	40	60
B	25,000	50	75	25
C	18,000	60	20	80
D	30,000	80	50	50

Answer the following questions.

i) Find the average number of story books in shop A, C and D.

ii) Find the total number of Novels sold by shop A, if the number of unsold story books with shop A is 2600.

Q5) Attempt any one of the following: [1×6=6]

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

         Miximize $Z = 10x+15y$

         subject to

$$12x + 5y \leq 2700$$
$$5x + 10y \leq 2000$$

         $x, y \geq 0$

    b)   Find the inverse of the matrix

$$A = \begin{bmatrix} 7 & -2 \\ -6 & 2 \end{bmatrix}$$

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