Total No. of Questions : 5]

SEAT No. :

P2062

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F.Y. 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) In the ratio $\frac{a}{b}$, "b" is called _____.

i) Antecedent

ii) Consequent

iii) Parameter

iv) None of the above

b) If $x:y = 4:9$ and $x = 28$ then y = _____.

i) 54

ii) 63

iii) 72

iv) 81

P.T.O.

c) Percentage means per _____.

i) 100

ii) 200

iii) 300

iv) 500

d) If selling price is more than cost price then _____ in incurred.

i) Profit

ii) Loss

iii) Commission

iv) None of the above

e) ${}^{5}C_{3}$ = _____.

i) 3

ii) 5

iii) 10

iv) 20

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

a) In an identify matrix all the diagonal elements are 1.

b) A feasible solution of L.P.P need not satisfy all the constraints.

c) For the arrangements of objects permutation is required.

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

a) If the ratio of two numbers is 3:5 and their sum is 232. Find the numbers.

b) Find the number whose 14% is 84.

c) If $\begin{bmatrix} x & 6 \\ 4 & 8 \end{bmatrix}$ is a singular matrix, then find the value of x.

d) If ${}^{n}C_{6} = {}^{n}C_{4}$, then find ${}^{n}C_{2}$.

e) A sum of money double itself in 5 years. Find the rate of Simple interest.

f) The average of three numbers is 77. The first number is twice the second number and second number is twice the third number, then find the first number.

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

a) Find n, if ${}^{n}P_{3} = 3\ ({}^{n}C_{4})$

b) If $A = \begin{bmatrix} 4 & 5 \\ 3 & 7 \end{bmatrix}$, find a matrix X such that $A - 2X = \begin{bmatrix} 2 & 3 \\ 7 & 5 \end{bmatrix}$

c) What sum will amount to Rs. 4,000 in 3 years at the rate of interest 6% p.a. Compound interest?

d) An agent receives Rs. 1,275 as commission at the rate 7.5% on sales. Find the amount of his sales.

e) If 12 July 2018 is Sunday. What will be day on 12 July 2022?

f) Write a note on fundamental principle of counting.

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

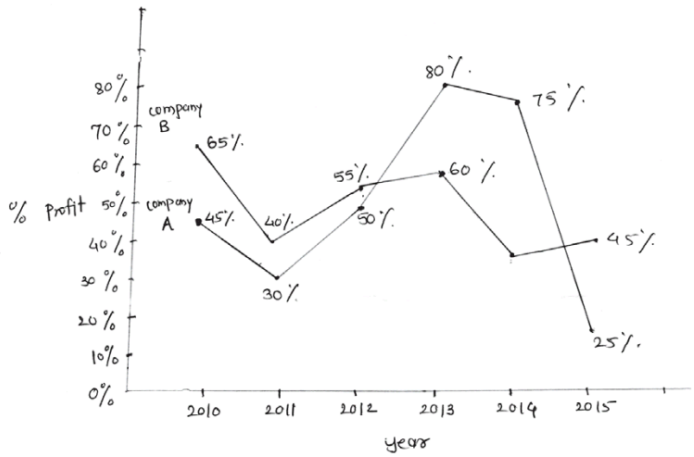
a) If $A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$, show that $A^2 = 4A - I$.

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

c) Ashok purchased 150 toys at Rs. 20 each and sold all toys at Rs. 25 each. Find total profit and percentage profit.

d) Explain feasible solution and optimal solution of the L.P.P

e) The following line graph show the percentage profit earned by two companies A and B in 6 different years.



Answer the following questions :

i) If the incomes of company A and B are same in 2014, then find the ratio of their expenditures.

ii) If expenditures of company A in 2010 is Rs. 60,000/- and that of company B in 2013 is Rs. 1,50,000/- then find sum of their incomes.

f) Explain singular and non-singular matrix.

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

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

Minimize $Z = 4x + 3y$

Subject to

$4x + 12y \geq 18$

$16x + 4y \geq 24$

$8x + 6y \geq 24$

$x, y \geq 0$

b) Find the inverse of the matrix :

$$A = \begin{bmatrix} 2 & 5 \\ 3 & 7 \end{bmatrix}$$

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SEAT No. :

PA-1895

[Total No. of Pages : 4

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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 ${}^{5}C_{1}$ = _____ .

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 ${}^{n}P_{r} = 3024$ and ${}^{n}C_{r} = 126$ 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

$$12x + 5y \le 2700$$
$$5x + 10y \le 2000$$
$$x, y \ge 0$$

b) Find the inverse of the matrix

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

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SEAT No. :

PA-1895

[Total No. of Pages : 4]

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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) The simple interest on rs 2,00,000 at 6% simple interest for 5 yr. is

i)26,000 ii) 60,000 iii) 14,000 iv) none

c) A work was purchase at Rs 100 and sold at Rs 120 find the value of profit in %.

i)85.5% ii) 86.5 % iii) 20% 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

e) The value of ${}^5C_2$ = _____ .

i) 10 ii) 20

iii) 40 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 permutation is required.

iii) Two values are said to be in inverse proportion when increase in one result in decrease in other result.

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

a) If a :b =4:5 and b:c= 6:7 find a:b:c.

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

c) If $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 4 & 1 \\ 4 & 1 & 3 \end{bmatrix}$ Find co-factor of A.

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) Find Amount of Rs 15,000 for 5 years at 10% rate of interest .

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

a) If $A = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$ then solve the equation 4A-2A-I

b) The difference between the two numbers is 64 and their ratio is 3:5,find the numbers.

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) Define the Linear function, Linear inequalities, Linear equalities, Feasible region.

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) Define any four types of matrices.

b) A committee of 5 persons is to be formed from 13 boys & 8 girls.In how many ways this can be done,if the committee is to include 1) exactly 3 girld 2) at least 4 girls.

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

d) Explain the term Proportion, Direct proportion, Inverse proportion and Continued proportion.

e) What sum will be amount to Rs. 2000 in 3 years at 6% compound interest?

f) Write a note on graphical method.

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

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

Miximize $Z = 20x+80y$

subject to

$4x+y= 2700$

$X+3y=2000$

$x, y=0$

b) Find the inverse of the matrix

$$A = \begin{bmatrix} 5 & 9 \\ 4 & 5 \end{bmatrix}$$