Total No. of Questions : 6]

SEAT No. :

P2942

[Total No. of Pages : 4

[5801]-411
S.Y. B.Com.
246F : BUSINESS STATISTICS-II
(2019 Pattern) (Semester - IV)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) *Question No. 1 and Questions No. 6 are compulsory.*
2) *Solve any three questions from the remaining question Nos. 2,3,4,5.*
3) *Figures to the right indicate full marks.*
4) *Use of calculator and statistical tables is alloved.*

Q1) Choose the correct alternative from each of the following. (any ten) **[10]**

a) In time series analysis the method of moving averages, is used to estimate_____.

i) seasonal variations ii) cyclical variations

iii) irregular variations iv) trend

b) In time series analysis, method of simple averages is used to estimate____.

i) trend ii) Seasonal variations

iii) cyclical variations iv) irregular variations

c) In time series analysis the exponential smoothing method helps to ____.

i) remove trend ii) estimate exponential trend

iii) estimate logarithmic trend iv) smoothout the fluctuations

d) The cost of slack variable is______.

i) –1 ii) 0

iii) 1 iv) 2

e) If the primal problem has n constraints and m variables then the no. of constraints in the dual problem is _____.

i) n ii) m

iii) m+n iv) m–n

f) In a L.P.P. functions to be maximized or minimized are called _____.

i) objective function ii) constraints

iii) basic solution iv) feasible solution

P.T.O.

g) When the total no. of demand is equel to no. of supply then the transportation problem is said to be _____.

i) balanced ii) unbalanced

iii) minimization iv) maximization

h) If one or more variable vanish in transportation problem then a basic solution to the system is called____.

i) basic solution ii) feasible solution

iii) degenerate solution iv) non feasible solution

i) The solution to a transportation problem with m- sources and n-destinations is feasible if the number of allocations are

i) m+n ii) m–n

iii) mn iv) m+n–1

j) The assignment problem is alwasy a_____ matrix.

i) square ii) circle

iii) rectangle iv) triangle

k) Which of the following is used to come up with a solution to the assignment problem?

i) Modi method ii) North west corner method

iii) Hungarian method iv) Stepping stone method

l) maximization assignment problem is transformed into a minimization problem by______.

i) adding each entry in a coloumn from the maximum value in that column.

ii) Subtracting each entry in a coloumn from the maximum value in that column.

iii) Subtracting each entry in a table from the maxium value in the table.

iv) adding each entry in a table from the maximum value in that table.

Q2) Attempt each of the following. **[5 each]**

a) Describe the form ‘Business cycle’. What are the four phases of business cycle? What are the subjects of studying business cycle.

b) Fit a trend line to the following time series by the least square method

Year (t)	2015	2016	2017	2018	2019
Production(Yt) (in lakh tons)	12	20	28	32	50

Estimate production for 2022 and 2024.

c) Estimate the trend using 10% smoothing constant for the following time series.

t	1	2	3	4	5	6	7	8	9	10
Yt	31	37	39	41	41	39	33	29	27	29

Q3) Attempt each of the following. **[5 each]**

a) Explain the real life situations from business where simple method may be used.

b) Obtain initial simplex table for

$$\text{Maximize} \quad z = 5x_1 + 3x_2$$

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

$$5x_1 + 2x_2 \leq 10$$

$$3x_1 + 8x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

c) Obtain dual of the following L.P.P.

$$\text{Minimize} \quad z = 7x_1 + 3x_2 + 8x_3$$

$$\text{Subject to} \quad 8x_1 + 2x_2 + x_3 \geq 3$$

$$3x_1 + 6x_2 + 4x_3 \geq 4$$

$$4x_1 + x_2 + 5x_3 \geq 1$$

$$x_1 + 5x_2 + 2x_3 \geq 7$$

$$x_1, x_2\ x_3 \geq 0$$

Q4) Attempt each of the following.

a) Obtain initial basic solution using North-West Corner method for the following transportation problem. **[5]**

	Markets			
Sources	D_1	D_2	D_3	Supply
O_1	5	1	8	12
O_2	2	4	0	14
O_3	3	6	7	4
Demand	9	10	11	30

b) Obtain initial basic feasible solution using VAM for the following transportation problem **[10]**

Sources	Destinations D_1	D_2	D_3	D_4	Supply
S_1	11	13	17	14	250
S_2	16	18	14	10	300
S_3	21	24	13	10	400
Demand	200	225	275	250	950

Q5) Attempt each of the following. **[15]**

a) Describe mathematical model for assignment problem (A.P)

b) Describe the procedure of Hangarian method to solve the assignment problem:

c) Find allocation that minimizes the overall processing cost, for the following problem.

Jobs J_1, J_2, J_3, J_4 are to be assigned to machines m_1, m_2, m_3, m_4. The processing cost ('00 Rs.) are given below.

	M_1	M_2	M_3	M_4
J_1	1	4	6	3
J_2	9	7	10	9
J_3	4	5	11	7
J_4	8	7	8	5

Q6) Write short notes on the following. (any 3) **[3×5=15]**

a) Explain how to fit AR(1)

b) Seasonal variations.

c) Transportation problem.

d) Balanced and unbalanced transportation problem.

c) Assignment problem.

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