

Roll No. _____

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SVIS-325-A-18
B.Sc. VIth Semester Degree Examination
Mathematical Statistics
(Applied Statistics and O.R)
Paper-VIII

Time : 3 Hours

Maximum Marks : 80

Instructions to candidates:

Statistical table and graph sheet will be supplied on required

Section-A

I. Answer all the following questions

(15×1= 15)

- 1) If $\sum P_{ij} \cdot q_{oj} = 2000$ and $\sum P_{oj} \cdot q_{oj} = 1000$ then a price index number is
 - a) 2
 - b) 200
 - c) 0.5
 - d) 50
- 2) In marshall edge worth price index number, the weights are
 - a) Price of current year
 - b) Quantity of current year
 - c) Average of base year and current year prices
 - d) average of base year and current year quantities
- 3) Additive model of time series is
 - a) T+S+C+I
 - b) TS+CI
 - c) TSC+I
 - d) T+SCI
- 4) Ind fitting trend $U_t = a + bt + ct^2$ the number of normal equations to find a,b and c are
 - a) two
 - b) three
 - c) four
 - d) None
- 5) In LPP, basic feasible solution satisfies

- a) only non negative resertications
 - b) only constraints
 - c) only objective function
 - d) Both constraints and non negative resertications
- 6) Transportation problem is balanced if
- a) $\sum d_i > \sum b_j$
 - b) $\sum d_i = \sum b_j$
 - c) $\sum d_i < \sum b_j$
 - d) None
- 7) In simplex method, the variable entries the basis for which net evaluation ($z_j - c_j$) is
- a) most negative
 - b) most positive
 - c) equal to zero
 - d) none
- 8) Assignment problem is balanced if its cost matrix is
- a) Square matrix
 - b) Rectangular matix
 - c) unit matrix
 - d) Identity matrix
- 9) In a game, minimax is obtained as
- a) Maximum of row minima
 - b) Minimum of column maxima
 - c) Minimum of row maxima
 - d) Maximum of column minina
- 10) Inventory model may be
- a) Deterministic
 - b) Probabilistic
 - c) a) or b)
 - d) none
- 11) _____ and _____ index numbers satisfies time reversal test
- 12) If price index number is 120, then 20% _____ in prices
- 13) _____ is the example of irregular variation in time series
- 14) For optimum solution of transportation problem for all non basic cells, net evalutaiton must be _____
- 15) The long form of CPM is _____

Section-B

II. Answer any FIVE of the following questions

(5× 5= 25)

- 16) Explain the steps involved in the construction of cost of living index numbers

- 17) Name different components of time series and explain any two
18) Solve the following L.P.P graphically

$$\text{Min } Z = x_1 + x_2$$

subject to

$$x_1 + 2x_2 \leq 2000$$

$$x_1 + x_2 \leq 1500$$

$$x_2 \leq 600$$

$$x_1, x_2 \geq 0$$

- 19) Find IBFS by vogels approximation method for following transportation an problem

	market				Supply	
	I	II	III	IV		
wave house	A	5	2	4	3	22
	B	4	8	1	6	15
	C	4	6	7	5	8
Requirement		7	12	17	9	

- 20) Define

- a) Setup cost
- b) holding cost
- c) storage cost
- d) least time

- 21) solve the following game by maximix and minimax principle

	Player B					
	B1	B2	B3	B4	B5	
PlayerA	A1	-2	0	0	5	3
	A2	3	3	1	2	2
	A3	-4	-3	-4	-2	6
	A4	5	3	-4	2	-6

22) Draw network diagram for following activities

Activity	Time
1-2	2
1-4	2
1-7	1
2-3	4
3-6	1
4-5	5
4-8	8
5-6	4
6-9	3
7-8	3
8-9	5

Section-C

III. Answer any **four** of the following questions

(4 × 10 = 40)

- 23) What are time reversal and factor reversal tests? Show that marshall edge worth index number satisfies time reversal test.
- 24) Explain ratio to trend method for finding reasonal indices.
- 25) Solve the following LPP by Bign M method

$$\begin{aligned} & 2x_1 + x_2 \geq 4 \\ \text{maximize } Z = x_1 + x_2 & \text{ subject to } x_1 + 7x_2 \geq 7 \\ & \text{and } x_1, x_2 \geq 0 \end{aligned}$$

26) Solve the following assignment problem

	A	B	C	D
p	6	10	14	12
Q	7	5	3	4
R	6	7	10	10
S	20	10	15	15

27) What is two persons zero sum game? Explain dominance property of solving a game.

28) Determine the sequence of jobs that minimise the total elapsed time

		Jobs						
		1	2	3	4	5	6	7
Machine	M1	3	12	15	6	10	11	9
	M2	8	10	10	6	12	1	3