2103N1681   Candidate's Seat No :_____

Integ. LLB Semester-3 Examination
IL BCom-202
Statistics

Time : 2-30 Hours]   **March-2024**   [**Max. Marks : 70**

Q.1 A Milkman wants to purchase cows and buffaloes. He can   (18)
accommodate at the most 20 animals in the available space. The daily expense on food and grass for cow is Rs. 5 and that on buffalo is Rs. 8. The milkman can spend at the most Rs. 136 a day. Each cow gives 5 litres milk and each buffaloes gives 7 litres milk every day. How many cows and buffaloes should be purchased so as to get maximum quantity of milk?

<div align="center">OR</div>

Q.1 (a) Maximize the objective function $Z = 20x + 10y$.   (10)
Following are the constraints:
$x, y \geq 0$,
$3x + y \geq 30$,
$x + 2y \leq 40$,
$4x + 3y \geq 60$

Q.1 (b) Give the meaning of Linear Programming and discuss the uses of Linear Programming   (8)

Q.2 Obtain solution of the following transportation problem by Vogel, Matrix Minima and North West Corner method.   (18)

Origin	Destinations				Supply
	D1	D2	D3	D4	
P	15	14	13	12	10
Q	16	17	12	14	17
R	5	6	8	7	13
S	3	2	10	1	10

<div align="center">OR</div>

Q.2 (a) Obtain solution of the following transportation problem by any two methods (10)

Origin	Destinations					Supply
	D1	D2	D3	D4	D5	

P.T.o

	1	2	3	4	5		
P	9	4	8	10	. 6		50
Q	6	7	3	4	3		20
R	3	5	2	6	4		30
Demand	40	10	20	20	10		100

Q.2 (b) State different method for solving transportation problem, Explain any one of them. (8)

Q.3 A national truck – rental services has a surplus of one truck in each of the cities A, B, C, D, E and F, and a deficit of one truck in each of the cities 1,2,3,4.5 and 6. The distance (in km) between the cities with a surplus and cities with a deficit displayed below. Find the best programme to minimize the total distance. (18)

From	To					
	1	2	3	4	5	6
A	26	57	24	10	36	37
B	7	14	34	66	35	50
C	12	24	45	17	17	36
D	30	35	33	22	28	37
E	14	25	24	15	18	11
F	67	25	25	36	15	25

OR

Q.3 (a) Given below is the Matrix of time in minutes taken by each worker on each different tasks. Assign the tasks to all of them in such a way that the total time taken to accomplish the tasks is minimized. (10)

Workers	Tasks			
	T_1	T_2	T_3	T_4
W_1	110	140	170	70
W_2	120	90	80	130

W₃	90	110	140	120
W₄	60	70	80	130

Q.3 (b) A factory owner finds from his past records that maintenance cost and resale price of a machine whose purchase price is Rs. 50,000 are as given below :   (8)

Year	1	2	3	4	5	6	7
Maintenance cost	1200	3200	5600	8400	11200	15200	18400
Resale price	72,000	56,000	40,000	32,000	28,000	20,000	12,000

Determine at which time it is advisable to replace the machine.

Q.4 (a) Find the Critical path and also Find EST, EFT,LST,LFT and Float time. (10)

Job	1-2	1-3	2-4	3-4	3-5	4-6	5-7	6-7
Time	8	20	16	12	20	24	8	16

OR

Q.4 (a) Draw PERT diagram of following activities after finding out expected time (10)

Activity	Sequence	Most likely time	Optimistic time	Pessimistic time
A	1-2	12	5	13
B	1-3	10	7	13
C	2-4	12	10	20
D	3-4	13	8	18
E	4-5	14	10	18

Q.4 (b) MCQS   (6)
    d. Coinciding
(01) Dummy activities in the network diagram are represented by _____
    a. Dummy events
    b. Thick straight lines
    c. Dotted arrows
    d. Circles
(02) PERT was developed by US Navy Special Project Office in _____.
    a. 1958
    b. 1957
    c. 1857
    d. 1956
(03) Total Float of the activities on the critical path will be _____.
    a. Less than Zero
    b. Always Zero
    c. Difference between LFT and LST of the activity
    d. Greater than Zero

(04) The cost matrix is not taken into consideration while allocating the units by_____
method.
    a. North west corner method
    b. Vogel's method
    c. Hungarian method
    d. Matrix minima method

(05) The linear function of the variables which is to be maximize or minimize is called___
    a. Constraint
    b. Objective function
    c. Decision variable
    d. None of the above

(06) The non -negative quantities representing the solution to given L.P. problem is called____
    a. Constraint
    b. Objective function
    c. Decision variable
    d. None of the above

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