LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.A. DEGREE EXAMINATION – **ECONOMICS**

FOURTH SEMESTER – **APRIL 2022**

UEC 4602 – OPERATIONS RESEARCH

Date: 23-06-2022 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART-A

Answer any FIVE questions in about 75 words each. (5X4=20 Marks)

1. State the main characteristics of operation research.
2. What is initial basic feasible solution?
3. Write a brief note on decision theories.
4. Give brief note on Modified Distribution method.
5. Bring out the optimality criterion of assignment problem.
6. Distinguish between PERT and CPM.
7. Elucidate the main objectives of an inventory management.

PART-B

Answer any FOUR questions in about 250 words each. (4X10=40 Marks)

8. Solve the LPP is to Minimize profit function

$Z = 50x + 18y$

Subject to the constraints

$2x + y \leq 100$

$x + y \leq 80$

$x \geq 0, \quad y \geq 0$

9. Solve the transport problem using NWCM

	Destination				
	A	B	C	D	Supply
Source 1	19	30	50	10	7
Source 2	70	30	40	60	9
Source 3	40	8	70	20	18
Demand	5	8	7	14	

10. Explain the steps involved in LPP formulation.
11. Solve the sequencing model then find total elapsed time and idle time of both the machines.

Job	1	2	3	4	5
A	5	1	9	3	10
B	2	6	7	8	4

12. There are five jobs to be assigned one each to 5 machines and the associated cost matrix is as follows:

Job	Machine					
		1	2	3	4	5
	A	11	17	8	16	20
	B	9	7	12	6	15
	C	13	16	15	12	16
	D	21	24	17	28	26
	E	14	10	12	11	13

Find the optimum assignment schedule.

13. Find out the EOQ and order schedule for raw materials and packing materials with the following data.
(i) Cost of ordering: Raw materials: Rs.1,000 per order.
Packing materials: Rs.5,000 per order
(ii) Cost of holding inventory: Raw materials: Rs.1 paise per unit p.m.
Packing materials: Rs.5 paise per unit p.m.
(iii) Production rate:2,00,000 units per month

14. A newspaper boy has the following probability of selling a magazine.

No of copies sold	Probability
10	0.10
11	0.15
12	0.20
13	0.25
14	0.30

Cost of copy is 30 paise and sale price is 50 paise he cannot return the unsold copies. How many copies he should order?

PART-C

Answer any TWO questions in about 900 words each. (2X20=40 Marks)

15. Find optimum solution for the following transportation problem where all the entries are unit costs.

	D1	D2	D3	D4	D5	AVAILABLE
	68	35	4	74	15	18
REQUIRED	57	88	91	3	8	17
	91	60	75	45	60	19
	52	53	24	7	82	13
	51	18	82	13	7	15
	16	18	20	14	14	82/82

16. The following matrix gives the payoff of different strategies (Alternatives) S_1, S_2, S_3 against conditions (Events) N_1, N_2, N_3, and N_4.

Alternatives	Events			
	N1	N2	N3	N4
S1	4,000	-100	6,000	18,000
S2	20,000	5,000	400	0
S3	20,000	15,000	-2000	1,000

Indicate the decision taken under the following approach:
(1) Pessimistic (2) Optimistic (3) Regret and (3) Laplace Criterion

17. A small maintenance project consist of the following 12 jobs

Jobs	1-2	2-3	2-4	3-4	3-5	4-6	5-8	6-7	6-10	7-9	8-9	9-10
Duration Days	2	7	3	3	5	3	5	8	4	4	1	7

Draw the narrow of the project. Summarize CPM calculation in a tabular form, calculating the three types of floats and determine the critical path.

18. How will you control the inventories of a manufacturing organization? Explain the various inventory costs associated with the organization.

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