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NJ—19—2022

FACULTY OF COMMERCE

M.Com. (First Year) (Second Semester) EXAMINATION

MAY/JUNE, 2022

(New Course)

OPERATION RESEARCH

Paper (MC-VI)

(Thursday, 30-6-2022)

Time : 9.30 a.m. to 1.15 p.m.

Time— 3.45 Hours

Maximum Marks—75

N.B. :— (i) All questions are compulsory.

(ii) All questions carry equal marks.

(i) सर्व प्रश्न अनिवार्य आहेत.

(ii) सर्व प्रश्नांना समान गुण आहेत.

1. Solve the following assignment problem :

15

खालील assignment problem सोडवा :

	1	2	3	4	5
A	8	8	8	11	12
B	4	5	6	3	4
C	12	11	10	9	8
D	18	21	18	17	15
E	10	11	10	8	12

P.T.O.

2. Find initial feasible solution of the following transportation problem by using North-West corner method : 15

खालील वाहतुक समस्येचे Initial feasible solution North-West corner method चा वापर करून काढा :

	w_1	w_2	w_3	w_4	Supply
P_1	190	300	500	100	70
P_2	700	300	400	600	90
P_3	400	100	400	200	180
Demand	50	80	70	140	340

Or

(किंवा)

- Find initial feasible solution of the following transportation problem by using Least Cost Method :

खालील वाहतुक समस्येचे Initial feasible solution Least Cost Method चा वापर करून काढा :

	D_1	D_2	D_3	D_4	Availability
O_1	20	22	17	04	120
O_2	24	37	09	07	70
O_3	32	37	20	15	50
Demand	60	40	30	110	

3. A book binder has one printing press, one binding machine and manuscripts of a number of different books. The time required to perform binding and printing operation of each book shown below : 15

एका प्रकाशकाकडे एक छपाई यंत्र, एक Binding यंत्र व काही पुस्तकांचे आराखडे होते. Binding आणि Printing करण्यासाठी लागणारा वेळ खाली दिला आहे :

Book	Printing Time (Hrs.)	Binding Time (Hrs.)
1	30	80
2	120	100
3	50	90
4	20	60
5	90	30
6	100	10

Determine the order in which books should be processed in order to minimize the total time. Also calculate total elapsed time and idle time for book machines.
कमीतकमी वेळात पुस्तकाचे कार्य पूर्ण करण्यासाठी कोणत्या क्रमाने पुस्तक छपाई करावी हे ठरवा.
तसेच Total Elapsed Time व दोन्ही मशीनसाठी लागणारा Idle Time काढा.

Or

(किंवा)

In the machine shop 8 different products are being manufactured each requiring time on two machines A and B as given below :

एका machine shop मध्ये 8 वस्तु दोन यंत्रांवर तयार करण्यासाठी लागणारा वेळ खाली दिला आहे :

Product	Time in Mins	
	Machine A	Machine B
I	30	20
II	45	30
III	15	50
IV	20	35
V	80	36
VI	120	40
VII	65	50
VIII	10	20

P.T.O.

Find optimum sequence, Elapsed time and Idle time on machine A and B.

Optimum sequence, Elapsed time आणि Idle time machine A आणि B काढा.

4. A truck owner finds from his past records that the maintenance cost per year of a truck whose purchase price is ₹ 80,00,000 are as given below : 15 एका ट्रक मालकाच्या अनुभवावरून ट्रकच्या वार्षिक देखभाल खर्चाचे विवरण खाली दिलेले आहे व ट्रकची खरेदी किंमत ₹ 80,00,000 आहे :

Year	Maintenance Cost (₹)	Resale Price (₹)
1	1,00,000	4,00,000
2	1,30,000	2,00,000
3	1,70,000	1,20,000
4	2,20,000	60,000
5	2,90,000	50,000
6	3,80,000	40,000
7	4,80,000	40,000
8	6,00,000	40,000

Determine at which time it is profitable to replace the truck.

ट्रक बदलणे कधी फायदेशीर राहिल हे सांगा.

Or

(किंवा)

Calculate Economic Order Quantity from the following information :

खालील माहिती वरून Economic Order Quantity माहित करा :

	Material X	Material Y
Annual consumption (units)	1,00,000	60,000
Ordering Cost (Per order)	₹ 30	₹ 12
Carrying cost Cost per unit	8%	20%
	₹ 20	₹ 20

5. Write short notes on (any two) :

15

- (i) Limitations of Operations Research
- (ii) North-West Corner Method
- (iii) Sequencing Problem
- (iv) Assignment Problem.

थोडक्यात टिपा लिहा (कोणत्याही दोन) :

- (i) Operations Research च्या मर्यादा
- (ii) North-West कॉर्नर मेथड
- (iii) क्रमवारी समस्या
- (iv) असाईनमेंट समस्या.