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HV—14—2023

FACULTY OF COMMERCE

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

APRIL/MAY, 2023

OPERATION RESEARCH

Paper-VI

(Tuesday, 9-5-2023)

Time : 10.00 a.m. to 1.00 p.m.

Time— Three Hours

Maximum Marks—75

N.B. :— (i) All questions carry equal marks.

सर्व प्रश्नांना समान गुण आहेत.

(ii) Simple calculator is allowed.

साधारण गणकयंत्रास परवानगी आहे.

1. Obtain the initial feasible solution for the following transportation problem by using Vogel's Approximation Method. 15

खालील वाहतुक समस्येचे Initial Feasible Solution by using Vogel's Approximation method वापरून काढा :

	D₁	D₂	D₃	D₄	Supply
O₁	10	20	5	7	10
O₂	13	9	12	8	20
O₃	4	15	7	9	30
O₄	14	7	1	1	40
O₅	3	12	5	19	50
Total	60	60	20	10	

P.T.O.

WT

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2. Solve the following assignment problem :

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खालील Assignment Problem सोडवा :

Tailors	Garments					
	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

Or

(किंवा)

Solve the following assignment problem :

15

खालील Assignment Problem सोडवा :

Operators	Machines			
	A	B	C	D
P	40	20	28	32
Q	44	16	36	40
R	32	16	36	28
S	28	20	24	16
T	32	36	28	20

WT

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3. In the machine shop, 8 different products are being manufactured each requiring time on two machines A and B as given below : 15

Machine Shop मध्ये 8 वेगवेगळे Produce Machine A व B च्या द्वारे निर्माण करण्यासाठी लागणारा वेळ खाली दिला आहे :

Product	Time (in mins)	Time (in mins)
	on Machine A	on 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

Calculate :

काढा :

- Optimal Sequence
- Total Elapsed Time
- Idle Time for Machine A
- Idle Time for Machine B.

P.T.O.

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Or

(किंवा)

Eight jobs are processed on two machines A and B. The time taken in hours by each job is given below :

आठ कार्य करण्यासाठी A व B या दोन मशीन क्रमाने वापरल्या जातात. या कार्यांना लागणारा वेळ तासांमधे खाली दिला आहे :

Task	Machine A	Machine B
A	5	6
B	4	10
C	22	12
D	16	8
E	15	20
F	11	7
G	9	2
H	4	21

Calculate :

काढा :

- Optimal Sequence
- Total Elapsed Time
- Idle Time for Machine A
- Idle Time for Machine B.

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4. The following table gives the running costs per year and resale price of certain equipment whose purchase price is ₹ 1,00,000 : 15

खालील टेबल मध्ये एका मशीनची जिची किंमत ₹ 1,00,000 आहे त्याची Running costs per year व resale price दिली आहे :

Year	Running Cost (₹)	Resale Price (₹)
1	30,000	70,000
2	32,000	50,000
3	36,000	34,000
4	42,000	24,000
5	50,000	16,000
6	58,000	10,000
7	68,000	10,000
8	80,000	10,000

At what year is the replacement due ?

कोणत्या वर्षी Replacement Due आहे?

Or

(किंवा)

- (a) Explain in detail the concept of EOQ .

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EOQ संकल्पना सविस्तर स्पष्ट करा.

P.T.O.

WT

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(b) Calculate Economic Order Quantity from the following information. 10

खालील माहितीच्या आधारे Economic Order Quantity काढा :

	Material X	Material Y
Annual Consumption (units)	1,00,000	60,000
Ordering Cost (per order)	₹ 30	₹ 12
Carrying Cost	8%	20%
Cost per Unit	₹ 20	₹ 20

5. Write short notes on (any *three*) : 15

थोडक्यात टिपा लिहा (कोणत्याही दोन) :

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

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