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Holocraft Sticker

Seat No 4550
Stk. No 3324031
Sub. OTE
Centre 1312

SAVITRIBAI PHULE PUNE UNIVERSITY

OTE552MJ-OTE

Sem:2 20324

amination	MCA Sem II Examination Apr
y & Date	06/05/2025
bject	Optimization techniques
er No.	OTE552MJ Sec
edium Answer	English

Seat No. : In figure & In words

4 5 5 0

four thousand five hundredd fifty

nature of idate

Instruction to Candidate

1. Candidate has to confirm seat number, subject and centre number printed on Bar code and Write it on attendance sheet.
   विद्यार्थ्याने प्रथम बार कोडवरील आसन क्रमांक, विषय व केंद्र क्रमांक तपासून योग्य असल्याची खात्री करावी आणि उपस्थिती पत्रकावर नोंदवावी.
2. Paste Bar Code in prescribed space.
   उत्तरपत्रिकेवरील विहित जागेतच बार कोड लावावा.
3. Do not write anything on Bar code sticker, otherwise it will be treated as unfairmeans.
   बार कोड स्टिकरवर काहीही लिहू नये, अन्यथा परीक्षा गैरप्रकार समजला जाईल.

Q. No.	Examiner	Moderator
1	4	
2	1	
3	5	
4	3	
5	1	
6		
7		
8		
9		
10		
11		
12		
Total in Figure	14	
Total in Words	Fourtn	
Signature		

Specific remarks regarding malpractice (in Red Ink)

Total	Marks in Figure	Marks in Words	Sign
Examiner	14	Fourtn	
Moderator			

१. विद्यार्थ्याने उत्तरपत्रिकेच्या मुखपृष्ठावर तसेच उपस्थिती पत्रकावर विहित जागेत आसन क्रमांक अंकात व अक्षरात बिनचूक लिहून स्वाक्षरी करावी.

२. उत्तरपत्रिकेवर फक्त निळ्या अथवा काळ्या शाईचा उपयोग करावा, अन्यथा उत्तरपत्रिकेचे मूल्यमापन केले जाणार नाही.

३. उत्तरपत्रिकेच्या पृष्ठक्रमांक ३ पासून लिहिण्यास प्रारंभ करावा.

४. संबंधित प्रश्नाचे अथवा उपप्रश्नाचे उत्तर जेथून सुरू होते तेथेच समासात प्रश्न क्रमांक, उपप्रश्न क्रमांक अचूक व स्पष्ट लिहावा, यासाठी वेगळ्या शाईचा उपयोग करू नये.

५. प्रत्येक पानाच्या दोन्ही बाजूस लिहावे, उत्तरपत्रिका किंवा पुरवणी उत्तरपत्रिकेचे कोणतेही पान फाडू नये, फाडल्यास परीक्षा गैरप्रकार समजून पुढील कार्यवाही करण्यात येईल.

६. पेपर संपण्यापूर्वी १० मिनिटे अगोदर इशारा घंटा होईल, त्यानंतर विद्यार्थ्याने उत्तरपत्रिका व पुरवणी उत्तरपत्रिकेवर होलोक्राफ्ट स्टिकर विहित जागेवरच लावावा.

७. कॉपी करणे किंवा दुसऱ्याच्या नावावर परीक्षेस बसणे यांसारख्या कृती 'महाराष्ट्र-प्रीव्हेन्शन ऑफ मालप्रॅक्टिस ॲक्ट युनिव्हर्सिटी, बोर्ड ॲण्ड अदर स्पेसिफाईड एक्झामिनेशन्स ॲक्ट, १९८२' (सा.फु.पु.वि. चा अध्यादेश क्रमांक ९) त्यानुसार संमत केलेला कायदा या अन्वये दंडही असेल.

Candidate shall fill all information about seat number, paper etc. in prescribed space and sign on the answer book and attendance sheet.

Candidate shall use blue or black ink only. Otherwise answer book will not be evaluated.

Candidate shall start writing answer from page no. 3 of the answer book.

Candidate shall mention question number, sub question number correctly at the beginning of the same and shall not use ink other than blue or black.

Candidate shall write on both sides of pages and shall not tear off any page, it will be treated as unfairmeans.

Warning bell will be given before 10 minutes of the concluding time. Candidate shall paste Holocraft Sticker at appropriate space on the answer book.

An Act of Copying or Impersonations at an Examination is Punishable under 'The Maharashtra Prevention of Malpractices at University, Board and Other Specified Examinations Act, 1982' (Ordinance 9 of SPPU). The Act passed to the effect.

Examiner and Moderator has to write marks on all given appropriate place only. Examiner should give assessment tick(✓) or (×) in the margin.

Q. No.	Examiner	Moderator	Verification	Revaluation
1	04			
2	1			
3	5			
4	2+1			
5	1			
6				
7				
8				
9				
10				
11				
12				
Total				

T. E. /Q.No.

Q.2

a)

→

Job	J1	J2	J3	J4	J5	J6	J7
M1	3	8	7	4	9	8	7
M2	4	3	2	5	1	4	3
M3	6	7	5	11	5	6	12

Step-1

Find the min of M1 and maximum of M2 also minimum of M3.

for the ~~for~~ checking that condition are satisfied or not.

Here are formula for checking condition

- $\min(m1) \geq \max(m2)$ or $\min(m3) \geq \max(m2)$

$\therefore$ $\min(m1) = 3$, $\max(m2) = 5$, $\min(m3) = 5$

conditions :-

① $\min(m1) \geq \max(m2)$
$3 \geq 5$ = (F)

② $\min(m3) \geq \max(m2)$
$5 \geq 5$ = (T)

condition 1 is false.

condition 2 is true and satisfied.

So we can continue this equation. for this equation we can need at least one condition is satisfies.

Step-2 Now assigning two machine G and H for finding optimal sequence.

G = m1 + m2

H = m2 + m3.

Q. P. /Q.No.

Job	J1	J2	J3	J4	J5	J6	J7
G	7	11	9	9	10	12	10
H	10	10	7	16	6	10	15

∴ optimal Sequencen.

J4	J2	J6	J7	J1	J3	J5

G H

Step-3 Finding idle time.

	M1		M2		M3	
Job	in	out	in	out	in	out
J4	0	4	4	9	9	20
J2	4	12	12	15	20	27
J6	12	20	20	24	27	33
J7	20	27	27	30	33	42
J1	27	30	30	34	42	48
J3	30	37	37	39	48	53
J5	37	46	46	47	53	58

∴ the elapsed time for all machine is = 58 /hrs.

∴ Idle time for m1 = (58-46) = 12 /hrs

∴ Idle time for m2 = (58-47) + 4 + 3 + 5 + 3 + 3 + 7
= 36 /hrs

∴ Idle time for m3 = (58-58) + 9 = 9 /hrs.

Q-3 B

Solution:-

Daily Demand	Probability	cumilative probability	Tag numbers
10	0.15	0.15	00 - 14
20	0.10	0.25	15 - 24
30	0.40	0.65	25 - 64
40	0.20	0.85	65 - 84
50	0.15	1.00	85 - 99

2.

Day	Random numbers	Demand
1	69	40
2	07	10
3	08	10
4	74	40
5	82	40
6	20	20
7	72	40
8	14	10
9	75	40
10	12	10
11	25	20

∴ Demand = 280

∴ the estimate average balance stock

$= \frac{280}{11} = 25.45$

5

	Q.No.						TOTAL
E							
M							

Q. No./Q.No.

Q.4B

a)

Focus	CPM	PERT
Full form	Critical path method	Program Evaluation Review Techniques
time	time consuming (considernic)	time less chek. (passimarnic Assimarnic most likely etc)
use	Repetative Projects like (construction)	For Research methodology new topic or research
behaviour	Define (predictible)	uncertain (non-predictible)
cost	include cost Analysis	not prior for cost
Analysis	forcus on cost and time	focus on time and Risk.

F. Y. /Q.No.

Q.7

B

b)

→ Slack and surplus variable in optimization techniques.

Use for transportation cost calculation. while going throug... the solution.

When we going for check balance and unbalanced table before calculation and after that use [+,−] that time we use slack and surplus variable in transportation cost. for having minimum. cost of transportation.

Q. No./Q.No.

Q.5

B

	strategy1	strategy2	
Player 1	6	4	= 4
Player 2	5	3	= 3
	6	4	

Check the row minimum and and column maximum

Now check saddle point

max (minimum) = 4
min (maximum) = 4

∴ ~~in this we got~~

$\bar{\gamma} = \gamma = 4$

$\bar{\gamma} = \gamma = 4$

∴ this is saddle point and and equation is Game theory of stop

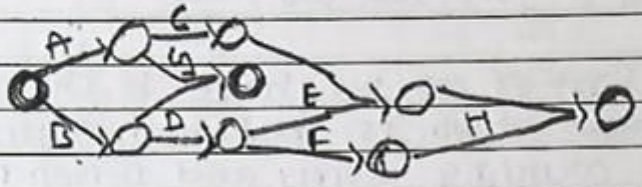
∴ the optimal strategy is (player 2 = strategy 2)

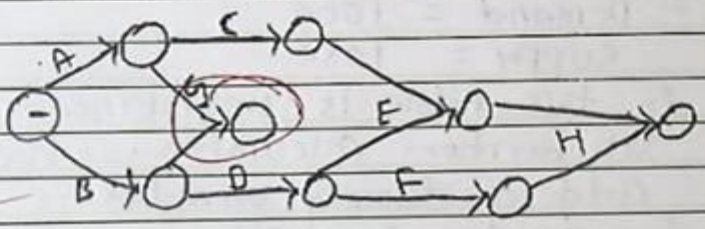
T. E. /Q.No.

Q4

a) Activity = A, B, C, D, E, f, G, H,
Duration = 4, 3, 6, 2, 5, 3, 7, 5.
predecessor = - - A B C,D D A,B E,F

b)





S. R./Q.No.

	Warehouse			
Plant	A	B	C	Supply
W	12	8	18	400
X	20	10	16	350
Y	24	14	12	300
Demand	500	200	300	

Step 1 First of all we have to check that table is balanced or unbalcend by counting Supply and Demand.

∴ Demand = 1000
Supply = 1050.
∴ this table is unbalanced.
So for further calculation we have to add a dummy variable in the Supply side as supply side is more than demand value.

Plant	A	B	C	Supply
V	0	50	0	
W	12	8	18	
X	20	10	16	
Y	24	14	12	
Demand	500	200	300	

we are adding dummy variable in demand side dummy = [D] .....

	Warehouse				
plant	A	B	C	D	Supply
W	12 [200]	8 [200]	18	0	200 400
X	20 [300]	10	16 [50]	0	250
Y	24	14	12 [250]	0 [50]	300
Demand	500 300	200 0	300 50	50	

so formula for checking transportation cost is

$m+n-1$

$4+3-1$

$= 6$

and allocation are also [6]
and all allocation are independent.

∴ $12\times200 + 20\times300 + 8\times200 + 16\times50 + 12\times250 + 0\times50.$

$= 2400 + 6000 + 1600 + 800 + 3000 + 0$

$= 13800$

∴ the transpon cost is : 13 800 unit

now we have to applied modi method for finding more minimum optimization cost by calculating [u] and [v]

	Q.No.						TOTAL
E							
M							

Q. N./Q.No.

	Warehouse.					
plant	A	B	C	D	Supply.	
W	12	8	—	—	400	U1 = 0
X	20	-	16	-	350	U2 =
Y	—	-	12	0	300	U3 =
Demand	500	200	300	50		
	V1=11	V2=20	V3=39	V4=72		

we calculat u and v from only occupied cells from table

the formula for calculation is

∴ ~~Cij =~~ Cij = Ui + Vj

So firstly we selcht atleast one U or V for calculation based on maximum allocation cell

Cij = Ui + Vj

C11 = 0 + V1 — C12 = 0 + 8 — C21 = 0 + 11

11 = 0 + V1 — 12 = 0 + 8 — 21 = 0 + 20

= 11 — = 20 — = 22

C23 = 0 + 11 — C33 = 0 + 39 — C34 = 0 + 72

23 = 0 + 16 — 33 = 0 + 39 — 34 = 0 + 72

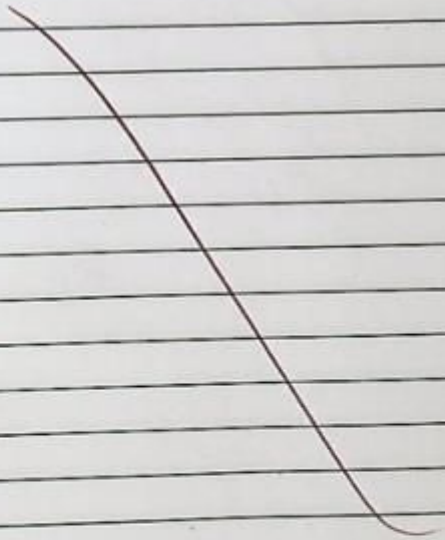
= 39 — = 72 — = 106.

Plant	Warehouse A	B	C	D	Supply
W	12 [200]	9 [200]	18	0	
X	20 [300]	10	16 [50]	0	
Y	24	14	12 [250]	0 [50]	
Demand	500	200	300	50	

$12 \times 200 + 20 \times 300 + 8 \times 200 + 16 \times 50 + 12 \times 250 + 0 \times 50$

$2400 + 6000 + 1600 + 800 + 3000 + 0$

$= 13,800$



	Q.No.						TOTAL
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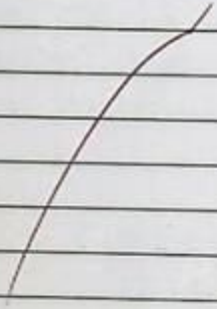
M							

प्र. क्र./Q.No.



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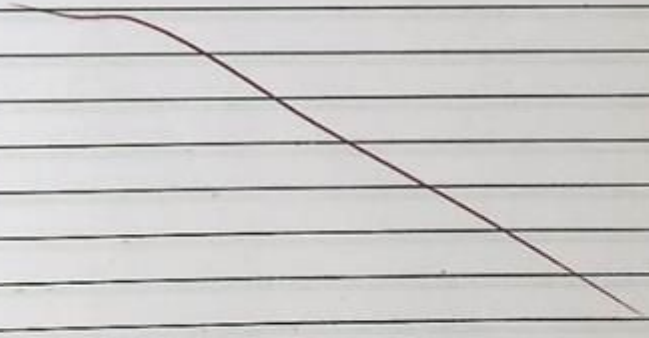

	Q.No.						TOTAL
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प्र. क्र./Q.No.

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	Q.No.						TOTAL
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प्र. क्र./Q.No.

Q. /Q.No.

	Q.No.						TOTAL
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Q. N. /Q.No.

Q. /Q.No.

	Q.No.						TOTAL
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प्र. क्र./Q.No.

Q.No.

	Q.No.						TOTAL
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Q. No./Q. No.