Seat No.

Total No. of Pages : 4

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Industrial Management and Operation Research

Sub. Code: 66837/81523/81800

Day and Date: Friday ,12-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. **All questions are compulsory**
2. **Draw neat labelled diagrams wherever necessary**
3. **Figures to the right indicate full marks**
4. **Use of Scientific calculator is allowed**

Q1) Solve any Two **[12]**

a. Explain line and Staff organization structure. **[6]**

b. Discuss the importance of Maslow's theory. **[6]**

c. What is the selection process followed in public sector undertaking? **[6]**

Q2) Solve any Two **[12]**

a. Classify the different types of material handling equipment? **[6]**

b. What is breakeven point? What is its significance? **[6]**

c. Explain the concept of channels of distribution and functions of advertising. **[6]**

Q3) Solve any Two **[10]**

a. Define small scale industry and list the objective of SSI. **[5]**

b. An engineering graduate wants to start a two wheeler servicing center. How he should establish the feasibility for the project? **[5]**

c. List the qualities required to become a good entrepreneur. **[5]**

Q4) Solve any Two **[12]**

a. a. Use Graphical method to solve the following: **[6]**

Maximize $Z = 50\ x1 + 80x2$

Subject to the conditions $5\ X1 + 6X2 \leq 600$

$X1 + 2X2 \leq 160$

$X1 \leq 80,\ X2 \leq 60$

and $x1, x2 \geq 0$

b. A Dairy feed company may purchase and mix one or more of the three types of grains containing different amounts of nutritional elements. The data given the following table: This production manager specifies that any feed mix for the livestock must meet at least minimal nutritional requirements and seeks the least costly among all such mixes. Formulate the LPP model for the problem. **[6]**

	Item	Machining time required (min)			Minimum Requirment
		I	II	III	
Nutritional ingredients	A	2	3	7	1250
	B	1	1	0	250
	C	5	3	0	900
	D	6	25	1	232
Cost/ unit weight(Rs)		41	35	96	

c. Use Graphical method to solve the following: **[6]**

Maximize $Z = 40\ x1 + 35x2$

Subject to the conditions $2\ x1 + 3x2 \leq 60$

$4\ x1 + 3x2 \leq 96$

and $x1, x2 \geq 0$

Q5) Solve any Two **[12]**

a. Find the optimal solution by MODI method. **[6]**

From	Transportation Cost in Rs/per unit					
	To					
	1	2	3	4	5	Supply
A	20 (50)	28	32	55	70	50
B	48	36 (60)	40	44	25 (40)	100
C	35 (50)	55 (10)	22 (50)	45 (40)	48	150
Demand	100	70	50	40	40	

b. The owner of small machine shop has 4 machinists available to assign to jobs for the day. Five jobs are offered with expected profit for each machinist on each job as follows. Assign machines to jobs which results in overall maximum profit. **[6]**

	Machine				
Jobs	**A**	**B**	**C**	**D**	**E**
M1	12	28	0	51	32
M2	12	34	11	23	9
M3	37	42	61	21	31
M4	0	14	37	27	30

c. Assign jobs to different machines so that the total cost is minimized. **[6]**

.	Machine			
Jobs	**A**	**B**	**C**	**D**
1	10	12	19	11
2	5	10	7	8
3	12	14	13	11
4	8	15	11	9

Q6) Solve any Two **[12]**

a. Determine optimal sequence, elapsed time and idle time (in hrs) of the following Six jobs on the machine A and B used in the same sequence to process these jobs. **[6]**

Job/m-c	J1	J2	J3	J4	J5	J6
Machine A	7	4	2	5	9	8
Machine B	3	8	6	6	4	1

b. Draw the Project Network for following activities and determine critical path and project duration by Forward and backward pass computation. **[6]**

Activity	A	B	C	D	E	F	G	H	I	J
Preceding activity	-	A	A	A	C	D	B	G	E,H	F,I
Duration(days)	1	4	3	4	3	2	1	4	2	2

c. Determine optimal sequence, elapsed time and idle time of the following five jobs on the machine M1, M2 and M3 used in the same sequence to process these jobs. **[6]**

	JOBS				
MACHINE	J1	J2	J3	J4	J5
M I	6	7	5	9	5
M II	4	1	2	5	3
M III	5	7	3	6	7

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (81523) Industrial Management and Operation Research Part 3 SEM 6
2] (101) Bachelor of Engineering (81800) Industrial Management and Operation Research Part 3 SEM 6
3] (101) Bachelor of Engineering (66837) Industrial Management & Operation Research Part 3 SEM 6