(i) Printed Pages : 4

 (ii) Questions :9
 Sub. Code :
 0
 8
 5
 6

 Exam. Code :
 1
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 2
 5

Roll No. ...

The Maximum amounts available of Crude Atand B arel

B.B.A. 3rd Semester

(d) What is the signific 2111 Perations Research?

OPERATIONAL RESEARCH Paper : BBA-202

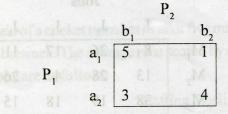
Time Allowed : Three Hours]

[Maximum Marks: 80

Note :- Attempt any four parts of question No. 1 of Section A. Each carries 5 marks. Attempt two questions each from Section B and Section C. Each carries 15 marks.

SECTION-A

I. (a) What are the assumptions of sequencing problems? 5(b) Solve the game :



(c) The Manager of an oil refinery must decide on the optimal mix of two possible blending processes of which the inputs and outputs per production run are as follows :

as solve an	Inputs	(Units)	Outputs (Units)		
Process	Crude A	Crude B	Gasoline X	Gasoline Y	
1	5	3	5	8	
2	4	5	4	4	

[Turn over

5

1

The Maximum amounts available of Crude A and B are 200 units and 150 units respectively. Market requirements show that at least 100 units of Gasoline X and 80 units of Gasoline Y must be produced. The profits per production run from process 1 and process 2 are Rs. 300 and Rs. 400 respectively. Formulate L.P. model. 5

(d) What is the significance of Operations Research?

(e) Solve Initial Basic Feasible solution by NWCM :

		De	stinati	on		
Maxim		S	TI	U	SS	
	Р	8	6	3	60	
Source	Q	5	10	9	50	
	R	6	6	4	70	
	DD	30	105	45	180	5

5

5

(f) Find the assignment of men to jobs that will minimise the total time.

		JODS					
		J ₁	J ₂	. J ₃	J ₄		
	M ₁	8	26	17	11		
	М,	13	28	4	26		
Men	M ₃	38	19	18	15		
	M ₄	19	26	24	10		

SECTION-B

II. Explain Hungarian Assignment Method to solve an assignment problem. 15

III. Solve the following LPP graphically :

Maximise $Z = 8000x_1 + 7000x_2$ subject to $3x_1 + x_2 \le 66$ $x_1 + x_2 \le 45$ $x_1 \le 20, x_2 \le 40$ $x_1, x_2 \ge 0.$ 15

IV. Solve the following transportation problem by VAM and use MODI Method to check optimality.

			nenouse		
	Hay for	x	Y	Z	SS
Carries	A	7	5	4	70
Plants	В	8	6	3	50
	C	9	5	6	60
	DD	20	120	40	180

Warehouses

V. A captain of a cricket team has to allot five middle batting positions to five batsmen. The average runs scored by each batsman at these positions are as follows :

ly with an a			Battin	g Posit	ions		
		III	IV	v	VI	VII	
	A	40	40	35	25	50	
Batsmen	B	42	30	16	25	27	
Datsmen	C	50	48	40	60	50	
	D	20	19	20	18	25	
	E	58	60	59	55	53	15

[Turn over

SECTION-C

VI. Use graphical method to minimise the time needed to process the following jobs on Machines shown i.e. for each machine find the job which should be done first. Also calculate the total elapsed time to compute both jobs :

Job	1	Job 2		
		Machine Sequence	Time (hrs)	
A	3	В	5	
Maeu Ba MAV vda	aldon 4 min	the follown a transpor	V PSolve	
Ē	2	A to che A optimation	3	
D	6	D	2	
Ē	2	E	6	
2	NY IS	X in o the	15	

VII. Solve the game whose pay-off matrix is :

		В	44	-	1. 73.	
	-1	-2	8	Nob		
A	7	5001	-1	20	DD	
	6	0	12			15

- VIII. A television repairman finds that the time spent on his job has an exponential distribution with a mean of 30 minutes. If the repairs sets in the order in which they came in and if the arrival of sets follows a Poisson distribution approximately with an average rate of 10 per hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in?
- IX. Explain:
 - (a) Saddle point
 - (b) Value of the game
 - (c) Mixed strategy and Pure strategy in the theory of games.

5,4,6