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2111N790

Candidate's Seat No :_____

ILLB Sem.-3 Examination

ILBBA 202

OR & QT

Time : 2-30 Hours] November-2024 [Max. Marks : 70

Q.1 Find Optimal Solution of the following transportation problem by using VAM Method. 18

		Sales Centres				Supply
		S_1	S_2	S_3	S_4	
Godowns	A	**8**	**9**	**6**	**3**	**19**
	B	**6**	**11**	**5**	**10**	**12**
	C	**3**	**8**	**7**	**9**	**14**
Demnad		**15**	**6**	**11**	**13**	

OR

Q.1 A An Indian company is preparing a network for laying the foundation of a new museum. Given the following set of the activities, their predecessor requirements and three time estimates of completion time. Draw the network and determine critical path. 10

Activity	Predecessor	Time Estimates (Weeks)		
		Optimistic	Pessimistic	Most Likely
A	-	2	4	3
B	-	8	8	8
C	A	7	11	9
D	B	6	6	6
E	C	9	11	10
F	C	10	18	14
G	C,D	11	11	11
H	F,G	6	14	10
I	E	4	6	5
J	I	3	5	4
K	H	1	1	1

Q.1 B Solve the following transportation problem using Least Cost Method. 08

Sales Outlets	Plants			Demand
	P1	P2	P3	
S1	60	40	240	3
S2	100	65	180	5
S3	260	210	60	6
Supply	6	4	4	

Q.2 The owner of a small machine shop has four mechanics available to assign jobs for the day. Five jobs are offered with expected profit for each mechanic on each job which is as follow. 18

(P.T.O)

		Job				
		I	II	III	IV	V
Mechanic	A	62	78	50	111	82
	B	71	84	61	73	59
	C	87	92	111	71	81
	D	48	64	87	77	80

Find by using the assignment method, the assignment of mechanics to the job that will result in a maximum profit. Which job should be declined?

OR

Q.2 A What are assignment problems?. Explain briefly its assumptions. 8

Q.2 B Solve the following Game using dominance property 10

	PLAYER 2			
PLAYER 1	**8**	**10**	**9**	**14**
	10	**11**	**8**	**12**
	13	**12**	**14**	**13**

Q.3 A manufacturer produces two types of machines **Super** and **Dooper**. There are two sections in his factory. In section **A** the assembling of parts is done and in section **B** the finishing of the product is done. The following are certain information available: 18

Section	No. of workers required	
	Super	**Dooper**
A	5	2
B	3	3

In section **A** not more than 180 workers can be employed and in section **B** not more than 135 workers can be employed. The number of **Dooper** type machines are to be manufactured, double or less than that **Super** type machines. If each **Super** type machine gives profit of Rs.100 and **Dooper** type machine gives profit of Rs.150.
Find how many machines of each type the manufacturer should produce so as to obtain maximum profit.

OR

Q.3 A Solve the following Game using dominance property 10

	PLAYER 2			
PLAYER 1	**8**	**10**	**9**	**14**
	10	**11**	**8**	**12**
	13	**12**	**14**	**13**

Q.3 B Write a short note on: Dominance Property. 08

Q.4 A Short Notes (**Any Two**) 10

(1) Optimality Test
(2) Application and scope of O.R.
(3) Limitations of Linear Programming Problem.
(4) Explain Models in O.R.

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Q.4 B **Select correct option and <u>write down answer with correct option</u>.** 06

1) In the transportation problem, if the total supply exceeds the total demand, the problem is:
(a) Balanced
(b) Unbalanced
(c) Degenerate
(d) Infeasible

2) In LPP, which of the following is a feasible solution?
(a) Any solution that violates one or more constraints
(b) Any solution that satisfies all constraints
(c) Any solution that maximizes the objective function without considering constraints
(d) A solution that only satisfies the objective function

3) The critical path in CPM is:
(a) The shortest path through the network
(b) The path with the least number of activities
(c) The longest path through the network with zero slack
(d) The path with maximum float

4) Which of the following is NOT a characteristic of Operations Research (OR) models?
(a) They require mathematical representation
(b) They focus only on qualitative data
(c) They seek optimal solutions
(d) They are used for decision-making

5) The assignment problem is a special case of the transportation problem where
(a) All supply and demand values are 1
(b) All costs are zero
(c) All supply and demand values are infinite
(d) All transportation paths are equal

6) A saddle point in a payoff matrix corresponds to:
(a) A position where both players can increase their gains
(b) The maximum of the row minima and the minimum of the column maxima
(c) A point where one player dominates the game
(d) A condition for a non-zero sum game