Cod	de: 9P1A22							R-1	9	
		I Semester Sup	opleme	ntarv Ex	aminatio	ons Fe	bruarv	/ 2021		
		•	•	Manag			,			
Ν	Max. Marks: 60							Time:		rs
	Answer all fiv	e units by choos		question f *******	rom eacł	n unit (5 x 12 =	60 Mai	rks)	
								Marks	со	Bloon
			UNIT-I					manto		Leve
1.	What are the fu	unctions of financia		ement? Ex	plain them	n in brie	f	12M	CO1	L
			OR						001	
2.	'The profit ma	ximization is not	an opera	tionally fe	asible crit	erion.'	Do you			
	agree? Illustrat	te your answer	-					12M	CO1	L
			UNIT-II							
3.	Explain the var	rious steps in the p		f capital bu	idgeting.			12M	CO2	L
			OR			•				
4.	XYZ Ltd is loop	king to take up the			•	formati	on:			
		Particulars		Cash flow						
		Coob receipte	C1 20000	C2 16000	C3					
		Cash receipts Cash payments	10000	8000	7000					
	-	Gross profit	10000	8000	7000					
		Depreciation	4000	4000	4000					
		Net profit	6000	4000	3000					
	The initial inve	•								
		stment of the proje	ect is estir							
	a) Calculate the	stment of the proje e project's paybac	ect is estir k period.	nated as F	Rs.12000.	000 an	d cash			
	a) Calculate theb) Of it is fouexpenses w	stment of the project's paybac und that the initia vill be more by Rs	ect is estir k period. al investn	nated as F nent will t	Rs.12000. De Rs. 9,0					
	a) Calculate theb) Of it is fouexpenses w	stment of the proje e project's paybac und that the initia	ect is estir k period. al investn . 1,000 ea	nated as F nent will t ach year, y	Rs.12000. De Rs. 9,0			12M	CO2	L
F	 a) Calculate the b) Of it is four expenses we accounting 	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investn . 1,000 ea UNIT–III	nated as F nent will k ach year, v	Rs.12000. De Rs. 9, what will b	e the p	oroject's	12M	CO2	L
5.	 a) Calculate the b) Of it is four expenses we accounting What are the 	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investn . 1,000 ea UNIT–III vorking ca	nated as F nent will t ach year, v	Rs.12000. be Rs. 9, what will b scuss the	e the p	oroject's			
5.	 a) Calculate the b) Of it is four expenses we accounting What are the 	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement	nated as F nent will t ach year, v	Rs.12000. be Rs. 9, what will b scuss the	e the p	oroject's	12M 12M	CO2 CO3	
	 a) Calculate the b) Of it is four expenses we accounting What are the determine the second secon	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea <u>UNIT–III</u> vorking ca quirement OR	nated as F nent will k ach year, v apital? Di s of a firm	Rs.12000. be Rs. 9, what will b scuss the	e the p	roject's rs that			
	 a) Calculate the b) Of it is four expenses we accounting What are the determine the second secon	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea <u>UNIT–III</u> vorking ca quirement OR	nated as F nent will k ach year, v apital? Di s of a firm	Rs.12000. be Rs. 9, what will b scuss the	e the p	roject's rs that			L
	 a) Calculate the b) Of it is fou expenses we accounting What are the determine the we have 	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea <u>UNIT–III</u> vorking ca quirement OR	nated as F nent will k ach year, v apital? Di s of a firm	Rs.12000. be Rs. 9, what will b scuss the	e the p	roject's rs that	12M	CO3	L
6.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the of the termine termine the termine termin	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV	mated as F ment will t ach year, w apital? Di s of a firm plain the p	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M 12M	CO3 CO3	L
6.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the of the termine termine the termine termin	stment of the project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implicatio	mated as F ment will t ach year, w apital? Di s of a firm plain the p	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M	CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the we determine the we would yo methods. Explain the accounting incom 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital rec u monitor receiva	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication	mated as F ment will t ach year, w apital? Di s of a firm blain the p	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the of the determine the of the would yo methods. Explain the accounting incom The capital structure 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital rec u monitor receiva assumptions and me approaches.	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication	mated as F ment will t ach year, w apital? Di s of a firm blain the p	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses. How would your methods. Explain the accounting incom The capital structs 8% Debentures 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red working capital red assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll	mated as F ment will t ach year, w apital? Di s of a firm blain the p	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses. How would yo methods. Explain the accounting incom The capital struct 8% Debentures 6% Preference 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital rec u monitor receiva assumptions and me approaches.	ect is estir ect is estir it period. al investm . 1,000 ea <u>UNIT–III</u> vorking ca quirement OR bles? Exp <u>UNIT–IV</u> implication OR ., is as foll	mated as F ment will k ach year, v apital? Di s of a firm blain the p ons of the ows:	Rs.12000. be Rs. 9, what will b scuss the ros and c	e the p e facto ons of	roject's rs that various	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses we account and the expense	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red w monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500	ect is estir k period. al investm . 1,000 ea UNIT–III orking ca quirement OR bles? Exp <u>UNIT–IV</u> implication OR ., is as foll 0000 s.20 each	mated as F ment will t ach year, w apital? Di s of a firm plain the p ons of the ows:	Rs.12000. be Rs. 9, what will b scuss the ros and c ros and c	e the p e facto ons of ome a	rs that various	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses. How would your methods. Explain the accounting incom The capital struction of the capital struction of the expected grow at 7% for the	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red bu monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll 0000 cs.20 each y share c ax rate is a	mated as F ment will the ach year, w apital? Di s of a firm plain the p ons of the ows: m = 200000 apital is R assumed to	Rs.12000. be Rs. 9, what will b scuss the ros and c ros and c e net inc e net inc 00 s.2 per sh o be 50%.	e the p e facto ons of ome a	rs that various and net	12M 12M	CO3 CO3	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the end of the would yo methods. Explain the accounting incom The capital struct 8% Debentures 6% Preferences 100000 Equity The expected grow at 7% for You are required 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return.	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll 0000 cs.20 each y share c ax rate is a	mated as F ment will the ach year, w apital? Di s of a firm plain the p ons of the ows: m = 200000 apital is R assumed to	Rs.12000. be Rs. 9, what will b scuss the ros and c ros and c e net inc e net inc 00 s.2 per sh o be 50%.	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO3 CO4	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses. How would your methods. Explain the accounting incom The capital struction of the capital struction of the expected grow at 7% for the	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red bu monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit	ect is estir k period. al investm . 1,000 ea UNIT-III vorking ca quirement OR bles? Exp UNIT-IV implication OR ., is as foll 0000 s.20 each y share c ax rate is a ne weighte	mated as F ment will the ach year, w apital? Di s of a firm plain the p ons of the ows: m = 200000 apital is R assumed to	Rs.12000. be Rs. 9, what will b scuss the ros and c ros and c e net inc e net inc 00 s.2 per sh o be 50%.	e the p e facto ons of ome a	rs that various and net	12M 12M	CO3 CO3	
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the end of the would yo methods. Explain the accounting incom The capital struct 8% Debentures 6% Preference 100000 Equity The expected grow at 7% for You are require Ltd., 	stment of the project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital rec u monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit red to compute th	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll 0000 s.20 each y share c ax rate is a he weighte UNIT–V	mated as F ment will k ach year, w apital? Di s of a firm olain the p ons of the ows: n = 200000 apital is R assumed to ed average	Rs.12000. be Rs. 9, what will b scuss the ros and c e net inc e net inc 00 s.2 per sh b be 50%. e cost of c	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO3 CO4	L
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the end of the would yo methods. Explain the accounting incom The capital struct 8% Debentures 6% Preference 100000 Equity The expected grow at 7% for You are require Ltd., 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red ou monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit rever. Corporate ta red to compute the l policy affect the	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll 0000 s.20 each y share c ax rate is a he weighte UNIT–V	mated as F ment will k ach year, w apital? Di s of a firm olain the p ons of the ows: n = 200000 apital is R assumed to ed average	Rs.12000. be Rs. 9, what will b scuss the ros and c e net inc e net inc 00 s.2 per sh b be 50%. e cost of c	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO3 CO4	
6. 7.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the expenses we accounting What are the determine the expenses we account of the determine the expected of the capital structs The capital structs 6% Preference 100000 Equity The expected of the exp	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red ou monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit rever. Corporate ta red to compute the l policy affect the	ect is estir k period. al investm . 1,000 ea UNIT–III vorking ca quirement OR bles? Exp UNIT–IV implication OR ., is as foll 0000 s.20 each y share c ax rate is a he weighte UNIT–V	mated as F ment will k ach year, w apital? Di s of a firm olain the p ons of the ows: n = 200000 apital is R assumed to ed average	Rs.12000. be Rs. 9, what will b scuss the ros and c e net inc e net inc 00 s.2 per sh b be 50%. e cost of c	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO4 CO4	
6. 7. 8.	 a) Calculate the b) Of it is four expenses we accounting What are the determine the end of the would your methods. Explain the accounting incom The capital struction of the capital struction of the expected grow at 7% for You are required the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its assisted as a second control of the explain its as a second control of the explanation of the expl	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red ou monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit rever. Corporate ta red to compute the l policy affect the	ect is estir k period. al investm 1,000 ea UNIT-III vorking ca quirement oR bles? Exp UNIT-IV implicatio OR , is as foll 0000 s.20 each y share c ax rate is a te weighte UNIT-V e value of OR	mated as F ment will k ach year, w apital? Di s of a firm olain the p ons of the ows: n = 200000 apital is R assumed to ed average	Rs.12000. be Rs. 9, what will b scuss the ros and c e net inc e net inc 00 s.2 per sh b be 50%. e cost of c	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO4 CO4	
5. 6. 8. 9.	 a) Calculate the b) Of it is fourexpenses we accounting What are the determine the end of the would your methods. Explain the acoperating incom The capital struction of the capital struction of the expected grow at 7% for You are required to the explain its assisted write brief note 	stment of the project's paybac e project's paybac und that the initia vill be more by Rs rate of return. e concepts of w working capital red ou monitor receiva assumptions and me approaches. ucture of ABC Ltd. s = Rs. 1500000 e shares = Rs. 500 share capital of R dividend on equit ever. Corporate ta red to compute the umptions	ect is estir k period. al investm 1,000 ea UNIT-III vorking ca quirement oR bles? Exp UNIT-IV implicatio OR , is as foll 0000 s.20 each y share c ax rate is a te weighte UNIT-V e value of OR	mated as F ment will k ach year, w apital? Di s of a firm olain the p ons of the ows: n = 200000 apital is R assumed to ed average	Rs.12000. be Rs. 9, what will b scuss the ros and c e net inc e net inc 00 s.2 per sh b be 50%. e cost of c	e the p e facto ons of ome a	rs that various and net	12M 12M 12M	CO3 CO4 CO4	

R-19R-19Code: 9P1A27M.B.A. II Semester Supplementary Examinations February 2021Operations ResearchMax. Marks: 60Time: 3 HoursAnswer all five units by choosing one question from each unit ($5 \times 12 = 60$ Marks)**********Marks colspan="2">BoomeImage: Note the following LP. Py using graphical method.Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \leq 1,000$ $x_1 + x_2 \leq 800$ $x_1 \leq 400$ and $x_2 \geq 0$ GMOR2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP:Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \leq 4$ $x_1, x_2 \geq 0$ GRONON $x_1, x_2 \geq 0$ $x_1, x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \leq 4$ $x_1, x_2 \geq 0$ GMON $x_1, x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1, x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1, x_2 \geq 0$ M </th <th>Н</th> <th>lall T</th> <th>icket Nur</th> <th>mber :</th> <th></th>	Н	lall T	icket Nur	mber :																																																																																																																																																																																																																																																																				
M.B.A. II Semester Supplementary Examinations February 2021 Operations Research Max. Marks: 60 Time: 3 Hours Answer all five units by choosing one question from each unit ($5 \times 12 = 60$ Marks) ********* Marks CO Bloom UNIT-I 1. a) Define OR and discuss its scope. b) Solve the following L.P.P by using graphical method. Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 0$ and $x_2 \ge 0$ OR 2. a) Describe the types of OR models. b) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ ON 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{D1}{D2} \frac{D3}{D4} \frac{Supply}{S1}}{S2 2 2 4 3 3 2 2}$ \boxed{OR} 4. a) Explain the Mathematical model of transportation Problem. 4M													R-1	9																																																																																																																																																																																																																																																										
Operations ResearchMax. Marks: 60Time: 3 HoursAnswer all five units by choosing one question from each unit ($5 \times 12 = 60$ Marks)Marks CO BloomeUNIT-I1. a) Define OR and discuss its scope.6M6Mb) Solve the following L.P.P by using graphical method.Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \leq 1000$ $x_1 + x_2 \leq 800$ $x_1 \leq 400$ and $x_2 \geq 700$ $x_1 \geq 0$ and $x_2 \geq 0$ 6MOR2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP:Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Matimize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Matimize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1 + x_2 \geq 0$ Matimize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ $x_1 - x_2 \geq 0$ Matimize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \leq 4$ <																																																																																																																																																																																																																																																																								
Answer all five units by choosing one question from each unit ($5 \times 12 = 60$ Marks) ********* Marks CO Biome Level 1. a) Define OR and discuss its scope. 6M b) Solve the following L.P.P by using graphical method. Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 400$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ OR 2. a) Describe the types of OR models. 4M b) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Maximize $Z = 2x_1 + 3x_2$ Subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ Solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : I = I = 1 I =																																																																																																																																																																																																																																																																								
$\begin{tabular}{ c c c c c } \hline Warks & CO & Bloome \\ \hline UNIT-I & a) & Define OR and discuss its scope. & 6M & & & & & & & & & & & & & & & & & $	Ν	Max. Marks: 60 Time: 3 Hours																																																																																																																																																																																																																																																																						
UNIT-I1. a) Define OR and discuss its scope.6Mb) Solve the following L.P.P by using graphical method.Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 0$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ 6MOR2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8MONIT-II3. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :4MDemand 3 3 2 2ORAAAOR		A	nswer all	five units	s by ch	oosing		-		n eac	ch unit (5 x 12	= 60 Mark	s)																																																																																																																																																																																																																																																										
UNIT-I6M1. a) Define OR and discuss its scope.6Mb) Solve the following L.P.P by using graphical method. Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \ge 400$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ 6MOR0R2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M2. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :4Mc) Find the starting solution M the data $3 = 2 = 2$ $M = 3 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2$													Marks	со																																																																																																																																																																																																																																																										
1. a) Define OR and discuss its scope. 6M b) Solve the following L.P.P by using graphical method. Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 400$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ $x_1 \ge 0$ and $x_2 \ge 0$ 6M OR OR 2. a) Describe the types of OR models. 4M b) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M IMIT-II 0 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M b) Find the starting solution $x_1 + x_2 = 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M \overline{M} $\overline{S1}$ $\overline{3}$ $\overline{7}$ $\overline{6}$ $\overline{4}$ $\overline{5}$ $\overline{S2}$ 2 4 3 2 $\overline{2}$ $\overline{3}$ $\overline{4}$ $x_1 + x_2 = 2$ $x_2 + 2$ $\overline{3}$ $\overline{2}$ $\overline{2}$ $\overline{3}$ $\overline{3}$ $\overline{2}$	LINIT_I												Level																																																																																																																																																																																																																																																											
Maximize $Z = 4x_1 + 3x_2$ subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 400$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ 6MOR2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8MONL3. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :4MDemand 3 3 3 2 2MAOR4. a) Explain the Mathematical model of transportation Problem.4. a)	1.	a)	Define C	R and dis	scuss it	s scop							6M																																																																																																																																																																																																																																																											
subject to $2x_1 + x_2 \le 1,000$ $x_1 + x_2 \le 800$ $x_1 \le 400$ and $x_2 \le 700$ $x_1 \ge 0$ and $x_2 \ge 0$ 6M OR 2. a) Describe the types of OR models. 4M b) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M UNIT-II 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $ \boxed{\frac{11 1 22 13 3 7 6 4 5}{32 2 2 4 3 3 2 2}} $ 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M		b)				-		ohical n	nethod																																																																																																																																																																																																																																																															
$x_{1} + x_{2} \le 800$ $x_{1} \le 400 \text{ and } x_{2} \le 700$ $x_{1} \ge 0 \text{ and } x_{2} \ge 0$ GR 2. a) Describe the types of OR models. b) Using Penalty method solve the following LPP: $Maximize Z = 2x_{1} + 3x_{2}$ subject to $x_{1} + 2x_{2} \le 4$ $x_{1} + x_{2} = 3$ $x_{1}, x_{2} \ge 0$ 8M 101T-11 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $ \frac{1}{10000000000000000000000000000000000$																																																																																																																																																																																																																																																																								
$x_{1} \leq 400 \text{ and } x_{2} \leq 700$ $x_{1} \geq 0 \text{ and } x_{2} \geq 0$ OR 2. a) Describe the types of OR models. 4M b) Using Penalty method solve the following LPP: Maximize $Z = 2x_{1} + 3x_{2}$ subject to $x_{1} + 2x_{2} \leq 4$ $x_{1} + x_{2} = 3$ $x_{1}, x_{2} \geq 0$ 8M UNIT-II 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\overline{\frac{D1}{D1} \frac{D2}{D3} \frac{D4}{5} \frac{Supply}{53} \frac{S}{3} \frac{4}{3} \frac{3}{3} \frac{8}{5} \frac{5}{3} \frac{3}{3}} \frac{Supply}{3} \frac{SM}{OR}$ 4. a) Explain the Mathematical model of transportation Problem. 4M					subje	ct to 2	$x_1 + x_2 =$	≤1,000	1																																																																																																																																																																																																																																																															
$x_{1} \ge 0 \text{ and } x_{2} \ge 0 $ OR 2. a) Describe the types of OR models. 4M b) Using Penalty method solve the following LPP: Maximize $Z = 2x_{1} + 3x_{2}$ subject to $x_{1} + 2x_{2} \le 4$ $x_{1} + x_{2} = 3$ $x_{1}, x_{2} \ge 0$ 8M $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{11} \frac{1}{12} \frac{1}{13} \frac{1}{7} \frac{1}{6} \frac{4}{4} \frac{5}{5} \frac{3}{3} \frac{1}{2} \frac{2}{2} \frac{1}{3} \frac{3}{3} \frac{4}{3} \frac{3}{8} \frac{8}{5} \frac{5}{3} \frac{3}{3} \frac{1}{2} \frac{3}{2} \frac{2}{2} \frac{1}{4} \frac{3}{3} \frac{2}{2} \frac{2}{2} \frac{1}{4} \frac{1}{3} \frac{1}{4} \frac{1}{3} \frac{2}{2} \frac{1}{2} \frac{1}{4} \frac{1}{3} \frac{1}{4} \frac{1}$						x	$x_1 + x_2 \le$	800																																																																																																																																																																																																																																																																
OR2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M3. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also abtain the optimum solution :4Mc) $\overline{D1}$ $D2$ $D3$ $D4$ $Supply$ S137645S224322S343853Demand33228MOR4. a) Explain the Mathematical model of transportation Problem.4M				x_1 :	≤400 a	nd $x_2 \leq$	≤700																																																																																																																																																																																																																																																																	
2. a) Describe the types of OR models.4Mb) Using Penalty method solve the following LPP: Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M3. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also are obtained the optimum solution :4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also are obtain the optimum solution :4Mc) $\overline{D1}$ $D2$ $D3$ $D4$ $Supply$ $\overline{S1}$ 3 7 6 4 5 $\overline{S2}$ 2 4 3 2 2 $\overline{S3}$ 4 3 8 5 3 \overline{OR} \overline{AM}						$x_1 \ge$	≥ 0 and	$x_2 \ge 0$					6M																																																																																																																																																																																																																																																											
b) Using Penalty method solve the following LPP: $Maximize Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M $\boxed{\text{UNIT-II}}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{D1}{D1} \frac{D2}{D3} \frac{D3}{D4} \frac{Supply}{S1} \frac{S1}{3} \frac{3}{7} \frac{6}{6} \frac{4}{5} \frac{5}{3} \frac{2}{2} \frac{2}{5} \frac{4}{3} \frac{3}{2} \frac{2}{2} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{3}{3} \frac{2}{2} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{3}{5} \frac{3}{5} \frac{2}{5} \frac{2}{5} \frac{2}{5} \frac{4}{5} \frac{3}{5} \frac{2}{5} \frac{2}{5} \frac{2}{5} \frac{2}{5} \frac{4}{5} \frac{3}{5} \frac{3}{$							OR																																																																																																																																																																																																																																																																	
Maximize $Z = 2x_1 + 3x_2$ subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8MUNIT-II3. a) Illustrate MODI method to determine the optimum solution.4Mb) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution :M $\overline{D1}$ $\overline{D2}$ $\overline{D1}$ $\overline{D2}$ $\overline{D3}$ $\overline{D4}$ $\overline{S2}$ $\overline{C1}$ $\overline{C1}$ $\overline{D1}$ $\overline{D2}$ $\overline{D3}$ $\overline{D4}$ $\overline{S1}$ $\overline{S1}$ $\overline{S2}$ $\overline{C1}$ <tr <td="" colspan="2">$\overline{C1}$<!--</td--><td>2.</td><td>a)</td><td>Describe</td><td>e the type</td><td>s of OR</td><td>mode</td><td>ls.</td><td></td><td></td><td></td><td></td><td></td><td>4M</td><td></td><td></td></tr> <tr><td>subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M UNIT-II 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\frac{1}{102 03 04} Supply$ S1 3 7 6 4 5 S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 OR 4. a) Explain the Mathematical model of transportation Problem. 4M</br></br></br></br></td><td></td><td>b)</td><td>Using P</td><td>enalty me</td><td>ethod s</td><td>olve tl</td><td>ne follo</td><td>wing L</td><td>.PP:</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>$x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{1}{1111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{111111} \frac{1}{111111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111$</td><td></td><td></td><td></td><td>Ma</td><td>aximize</td><td>Z = 2</td><td>$x_1 + 3x_2$</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>$x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{11111}{1111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{1111111}{111111} \frac{1111111}{111111} \frac{11111111}{11111111} \frac{111111111}{111111111} \frac{111111111}{1111111111$</td><td></td><td></td><td></td><td></td><td>subje</td><td>ct to 2</td><td>$x_1 + 2x_2$</td><td>≤ 4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>UNIT-II 4M 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of transportation problem. 4M Image: solution of transportation problem. 4M Image: solution of transportation problem. 4M</td><td></td><td></td><td></td><td></td><td></td><td>$x_1 + x_2$</td><td>$x_2 = 3$</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> a) Illustrate MODI method to determine the optimum solution. b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : ¹ D1 D2 D3 D4 ¹ Supply ¹ S1 3 7 6 4 5 ¹ S2 2 4 3 2 2 ¹ S3 4 3 8 5 3 ¹ Demand 3 3 2 2 ¹ OR ⁴ M </td><td></td><td></td><td></td><td></td><td></td><td></td><td>$x_1, x_2 \ge$</td><td>20</td><td></td><td></td><td></td><td></td><td>8M</td><td></td><td></td></tr> <tr><td> b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : </td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Vogel's Approximation Method. Also obtain the optimum solution :</td><td>3.</td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td></td><td>b)</td><td></td><td>0</td><td></td><td></td><td></td><td>•</td><td></td><td></td><td>•</td><td></td><td>ру</td><td></td><td></td></tr> <tr><td>D1 D2 D3 D4 S1 3 7 6 4 5 S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td>voger s /</td><td></td><td></td><td>eniou.</td><td></td><td></td><td></td><td></td><td>501011011</td><td>•</td><td></td><td></td><td></td></tr> <tr><td>S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td colspan="7">D1 D2 D3 D4 Supply</td><td></td><td></td><td></td></tr> <tr><td>S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td></td><td colspan="7"></td><td></td><td></td><td></td></tr> <tr><td>Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td></td><td colspan="6"></td><td>-</td><td></td><td></td><td></td></tr> <tr><td>OR 4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td></td><td></td><td>nd</td><td></td><td></td><td></td><td></td><td></td><td>3</td><td>-</td><td>8M</td><td></td><td></td></tr> <tr><td>4. a) Explain the Mathematical model of transportation Problem. 4M</td><td></td><td></td><td></td><td>Dema</td><td>nu</td><td>ა</td><td></td><td></td><td>۷</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>4.</td><td>a)</td><td>Explain t</td><td>he Mathe</td><td>matica</td><td>mode</td><td></td><td></td><td>tion Pr</td><td>oblen</td><td>n.</td><td></td><td>4M</td><td></td><td></td></tr> <tr><td></td><td>••</td><td>b)</td><td>•</td><td></td><td></td><td></td><td></td><td>•</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>	2.	a)	Describe	e the type	s of OR	mode	ls.						4M			subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M UNIT-II 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $ \frac{1}{102 03 04} Supply $ S1 3 7 6 4 5 S2 2 4 3 2 2 		b)	Using P	enalty me	ethod s	olve tl	ne follo	wing L	.PP:							$x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{1}{1111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{111111} \frac{1}{111111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111$				Ma	aximize	Z = 2	$x_1 + 3x_2$									$x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{11111}{1111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{1111111}{111111} \frac{1111111}{111111} \frac{11111111}{11111111} \frac{111111111}{111111111} \frac{111111111}{1111111111$					subje	ct to 2	$x_1 + 2x_2$	≤ 4								UNIT-II 4M 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of transportation problem. 4M Image: solution of transportation problem. 4M Image: solution of transportation problem. 4M						$x_1 + x_2$	$x_2 = 3$									 a) Illustrate MODI method to determine the optimum solution. b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : ¹ D1 D2 D3 D4 ¹ Supply ¹ S1 3 7 6 4 5 ¹ S2 2 4 3 2 2 ¹ S3 4 3 8 5 3 ¹ Demand 3 3 2 2 ¹ OR ⁴ M 							$x_1, x_2 \ge$	20					8M			 b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 							-									Vogel's Approximation Method. Also obtain the optimum solution :	3.							-								$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		b)		0				•			•		ру			D1 D2 D3 D4 S1 3 7 6 4 5 S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M			voger s /			eniou.					501011011	•				S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M			D1 D2 D3 D4 Supply										S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M														Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M										-				OR 4. a) Explain the Mathematical model of transportation Problem. 4M					nd						3	-	8M			4. a) Explain the Mathematical model of transportation Problem. 4M				Dema	nu	ა			۷								4.	a)	Explain t	he Mathe	matica	mode			tion Pr	oblen	n.		4M				••	b)	•					•							
2.	a)	Describe	e the type	s of OR	mode	ls.						4M																																																																																																																																																																																																																																																												
subject to $x_1 + 2x_2 \le 4$ $x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ 8M UNIT-II 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $ \frac{1}{102 03 04} Supply $ S1 3 7 6 4 5 S2 2 4 3 2 2 		b)	Using P	enalty me	ethod s	olve tl	ne follo	wing L	.PP:																																																																																																																																																																																																																																																															
$x_1 + x_2 = 3$ $x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{1}{1111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{111111} \frac{1}{111111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111} \frac{1}{11111$				Ma	aximize	Z = 2	$x_1 + 3x_2$																																																																																																																																																																																																																																																																	
$x_1, x_2 \ge 0$ $\boxed{UNIT-II}$ 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : $\boxed{\frac{1}{1111} \frac{11111}{1111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{111111}{11111} \frac{1111111}{111111} \frac{1111111}{111111} \frac{11111111}{11111111} \frac{111111111}{111111111} \frac{111111111}{1111111111$					subje	ct to 2	$x_1 + 2x_2$	≤ 4																																																																																																																																																																																																																																																																
UNIT-II 4M 3. a) Illustrate MODI method to determine the optimum solution. 4M b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 4M Image: solution of the starting solution of the starting solution of transportation problem. 4M Image: solution of transportation problem. 4M Image: solution of transportation problem. 4M						$x_1 + x_2$	$x_2 = 3$																																																																																																																																																																																																																																																																	
 a) Illustrate MODI method to determine the optimum solution. b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : ¹ D1 D2 D3 D4 ¹ Supply ¹ S1 3 7 6 4 5 ¹ S2 2 4 3 2 2 ¹ S3 4 3 8 5 3 ¹ Demand 3 3 2 2 ¹ OR ⁴ M 							$x_1, x_2 \ge$	20					8M																																																																																																																																																																																																																																																											
 b) Find the starting solution in the following transportation problem by Vogel's Approximation Method. Also obtain the optimum solution : 							-																																																																																																																																																																																																																																																																	
Vogel's Approximation Method. Also obtain the optimum solution :	3.							-																																																																																																																																																																																																																																																																
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		b)		0				•			•		ру																																																																																																																																																																																																																																																											
D1 D2 D3 D4 S1 3 7 6 4 5 S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M			voger s /			eniou.					501011011	•																																																																																																																																																																																																																																																												
S2 2 4 3 2 2 S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M			D1 D2 D3 D4 Supply																																																																																																																																																																																																																																																																					
S3 4 3 8 5 3 Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M																																																																																																																																																																																																																																																																								
Demand 3 3 2 2 8M OR 4. a) Explain the Mathematical model of transportation Problem. 4M										-																																																																																																																																																																																																																																																														
OR 4. a) Explain the Mathematical model of transportation Problem. 4M					nd						3	-	8M																																																																																																																																																																																																																																																											
4. a) Explain the Mathematical model of transportation Problem. 4M				Dema	nu	ა			۷																																																																																																																																																																																																																																																															
	4.	a)	Explain t	he Mathe	matica	mode			tion Pr	oblen	n.		4M																																																																																																																																																																																																																																																											
	••	b)	•					•																																																																																																																																																																																																																																																																

	А	В	С	D	
Р	15	51	42	33	23
Q	80	42	26	81	44
R	90	40	66	60	33
	23	31	16	30	

8M

UNIT-III

5. A department head has four subordinates, and four tasks to be performed. The subordinates differ in efficiency, and the tasks differ in their intrinsic difficulty. His estimate, of the time each man would take to perform each task, is given in the matrix below:

Men						
Tasks	E	F	G	Н		
А	18	26	17	11		
В	13	28	14	26		
С	38	19	18	15		
D	19	26	24	10		

How should the tasks be allocated, one to a man so as to minimize the total man-hours?

b) Maximize the total sales of profit for the problem of assigning four sales persons to four different sales regions as shown in the following table

	R_1	R_{2}	R_{3}	R_4		
s_1	10	22	12	14		
<i>s</i> ₂	16	18	22	10		
<i>s</i> ₃	24	20	12	18		
s_4	16	14	24	20		
OR						

- 6. a) Differentiate between Transportation problem and Assignment problem
 - b) There are five jobs to be assigned one each to five machines. Find the minimum cost of the assignment.

	Machine							
job	1	2	3	4	5			
Α	11	17	8	16	20			
В	9	7	12	6	15			
С	13	16	15	12	16			
D	21	24	17	28	20			
E	14	10	12	11	15			

- 7. a) Explain (i) Pure strategy (ii) Mixed strategy (iii) Dominance principle
 - b) Consider the following payoff matrix with respect to player A and solve it optimally.

		Play	ver B		
		B_1	B_2		
	A_1	6	9		
Player A	A_2	8	4		
OR					

6M

6M

6M 6M

6M

6M

8. a) Solve the following 3×5 game using dominance property.

			F	Player	В	
		B_1	B_2	B_{3}	B_4	B_5
	A_1	2	5	10	7	22
Player A	A_2	3	3	6	6	44
	A_3	4	4	8	12	1

- b) In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average 36 minutes. Calculate the following:
 - I. the mean queue size(line length), and
 - II. the probability that the queue size exceeds 10.
 - III. If the input of trains increases to an average 33 per day, what will be the change in (i) and (ii)?

6M

6M

UNIT–I

9. The following table lists the jobs of a networks with their estimates.

-	-						
Jobs	Duration (days)						
(i-j)	Optimistic	Most likely	Pessimistic				
1-2	3	6	15				
1-6	2	5	14				
2-3	6	12	30				
2-4	2	5	8				
3-5	5	11	17				
4-5	3	6	15				
6-7	3	9	27				
5-8	1	4	7				
7-8	4	19	28				

i) Draw the project network,

- ii) Calculate the length and variance of the critical path, and
- iii) What is the approximate probability that the jobs on the critical path will be completed in 41 days?

12M

OR

10. Consider the following table summarizing the details of a project involving 10 activities.

Activity	Immediate Predecessors	Duration (weeks)
А	-	15
В	-	15
С	А	3
D	А	5
E	B,C	8
F	B,C	12
G	E	1
Н	E	14
I	D,G	3
J	F,H,I	14

- i) Construct a CPM network
- ii) Determine the critical path and project completion time.
- iii) Compute the total floats and free floats for non-critical activities.