·. ·.	• • •	2.30 - 4.30 pm UM02CBBS07 - Quantitative Techniques	
Note	: (1) Figures to t	Total Ma	rks: 60
	(2) Log table ar	id graph paper will be provided on request	
		o apa paper and provided on request.	
Q.1			
(a)	Derive mat	thematical form of a general linear programming problem.	05
(b)	Solve the f	ollowing linear programming problem by using simplex method	05
	Maximise	$Z = 3X_1 + 2X_2$	05
	Subject to	$2X_1 + X_2 \le 10$	
		$X_1 + 3X_2 \le 6$	
		$X_1, X_2 \ge 0$	
(c)	Solve the fr	blowing linear programming and low to the state	
	Minimise	7 = x + y	05
	Subject to	5x + 10y < 50	
		x + y > 2	
	•	x = y = 2 $y \leq 4$	
		x, y ≥ 0	
~ -		OR	
Q.1			
(a) T	Define follo	wing terms:	04
J	Feasible solu	ition.	
r	I Constraints,		
] · · r			
1 • • I •			
l I I b)	<ul> <li>Slack variable</li> <li>Solve the following</li> </ul>		05
l I I b)	Solve the fol Maximise	7 - 5y + 7y	
] I I b)	Solve the fol Maximise	Z = 5x + 7y 4x + 5y < 200	
] ] ] b)	Solve the fol Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$	
] ] ] b)	Solve the fol Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$	
] ] [b)	Solve the fol Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$	
1 1 (b) c)	Solve the fol Solve the fol Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$ owing linear programming problem by using simplex method	06
1 I I (b)	Solve the fol Maximise Subject to Solve the foll Maximise	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$ owing linear programming problem by using simplex method. $Z = 5X_1 + 7X_2$	06
1 1 (b) c)	Solve the fol Maximise Subject to Solve the foll Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$ owing linear programming problem by using simplex method. $Z = 5X_1 + 7X_2$ $4X_1 + 5X_2 \le 200$	06
] ] [b) c)	Solve the fol Maximise Subject to Solve the foll Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ $x, y \ge 0$ owing linear programming problem by using simplex method. $Z = 5X_1 + 7X_2$ $4X_1 + 5X_2 \le 200$ $3X_1 + 5X_2 \le 180$	06
1 1 (b) c)	Solve the fol Maximise Subject to Solve the foll Maximise Subject to	$Z = 5x + 7y$ $4x + 5y \le 200$ $3x + 5y \le 180$ wing linear programming problem by using simplex method. $Z = 5X_1 + 7X_2$ $4X_1 + 5X_2 \le 200$ $3X_1 + 5X_2 \le 180$ $2X_1 + 3X_2 \le 165$	06

(a)	What is of Trans	Tra po	anspo rtatio	ortati on Pr	ion Pı obler	obl n.	em î	? Alsc	deri	ive tł	he m	ather	natic	al forr	nulatio	n	05		
(b )	Solve the	e f	ollow	/ing r	ninim Io	ial a h	issig	nmer	nt pro	obler	n.					i	05		
			. 1	2	3	4	5												
		Δ	8		- <u></u>	<u>-</u>	1	<sup>,</sup>											
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(c)	Solve the	e fo	ollow	ing T	ransp	ort	atio	n Pro	blem	n Ma <sup>.</sup>	trix N	/linim	a me	ethod.		(	05		
			$D_1$	D <sub>2</sub>	D3	1	D₄	Sup	ply										
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Q.2																			
(a)	Solve the	e fo	ollowi	ing T	ransp	orta	atio	n Prol	blem	by \	/AM	meth	od.			C	)5		
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	B 10	6	18	14	-   1		300	)											
	C 2	1	24	13	· -		400	, )											
	b, 20		225	<u> </u>	/ <u> </u>	50	-100												
	-11-1		220		5 2	50													
(b)	Solve the	fo	llowi	ing Ti	ransn	orta	ation	Prot	سماد	hy N	lorth	Mag	tcor	norm	athad		-		
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(c)	Solvo the	fo	المسنة	nam	inim	ما م				I. I									
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		E	: 6	6	9	4	2												

Q.2 (a)

	ivitat are t	iiii										
S	Solve the f	followi	ng gar	ne usin	g Graph	ical me	ethod.					05
			F	Player E	} . 							
			I	<u>II I</u>	II IV							
	Player A	I	2	2 3	3-1							
		II	4	3 2	2 6							
										1		
	Solve the f	followi	ing gar	ne usin Plaver	g domii B	nance p	orinciple					05
			Т	T IUYCI	n iv							
			1									
	Player A	1	3	5 5	9 0							
		II	5	6	7 8							
		III	8	7 8	37							
		IV	4	2 5	53							
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	solve the	TOIIOW	ing gai	ne usir	ig domi	nance p	muciple					
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		11	3	4	2 4							
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		IV	0	4	0 8						•	
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	<b>.</b>											
	Player A	l T	2	4								
		II	2	3								
		III	3	2								
			1 .	6								
		IV	-2	U								
		IV	-2	U .	. •						•	
		IV	-2	U	. •							
	Write a no	IV ote on	-2 variat	ions du	ie to ass	ignable	e causes	5 <b>.</b> .			·	05
	Write a no	IV ote on	-2 variat	ions du	ie to ass	ignable	e causes	5.				05
	Write a no	IV ote on	· · variat	ions du	ie to ass	ignable data a	e causes	e vour (	conclus	ions.	·	05 10
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Q.4 (a)	Write the difference between Variable charts and Attribute charts.
(b)	The number of defects noticed in 20 clothes are given below. 1,4,3,2,5,4,6,7,2,3,2,5,7,6,4,5,2,1,3,8. Decide whether the process is in a state of statistical control or not?

(c) Samples of 400 bottles were taken daily for 15 days from a pharmaceutical company. The number of defective seals in these bottles are given below.
 Draw P chart for the data.

Diaw r chart for the water													4.0		4 -	1
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Defective	28	18	40	42	32	62	50	10	30	22	.80	<u>6</u> 2	76	56	30	
seals			l			1			L	L		L	L	l	L	1

OR

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