Lo E		nent No:		Exam Seat No:					
	C.U.SHAH UNIVERSITY								
			Winter Exa	amination-2018					
Sı	ıbject	Name: Op	eration Research						
Sı	ıbject	Code: 5CS	603WOR1	Branch: M.Sc.IT. (Web)	Tech)				
Se	emeste	er:3	Date: 04/12/2018	Time: 02:30 To 05:30	Marks:70				
_	(4)			ECTION-I		(07)			
Q-1		Attempt t	he Following questions			(07)			
	1	What is O				1			
	2 3		Form of LPP ack variable and Artificia	al vomoblo?		1 2			
	3 4		ack variable and Artificial egeneracy in Transportat			2			
	5		ptimality check?	ion problem.		1			
Q-2		Attempt a	all questions			(14)			
-	1		owing LP Problem Using	Graphical Method		<b>(7</b> )			
			$5X_1 + 10X_2$						
		Sub	$ject to  4x_1 + 6x_2 \le 360$						
			$3x_1 + 0x_2 \le 180$						

ext to 
$$4x_1 + 6x_2 \le 360$$
  
 $3x_1 + 0x_2 \le 180$   
 $0x_1 + 5x_2 \le 200$ 

and  $x_1, x_2 \ge 0$ 

Use the Simplex Method to solve the Following L.P Problem 2

**(7)** 

Maximize Z = 3x1 + 5x2 + 4x3

Subject to Constraints  $2x1+3x2 \le 8$ 

$$2x2+5x3 \le 10$$

$$3x1+2x2+4x3 \le 15$$
  
 $x1, x2, x3 \ge 0$ 

OR

Q-2 **Attempt all questions**  **(14)** 

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### 1 Solve following LP Problem Using Simplex Method

Max  $Z=3X_1+2X_2$ 

Subject to  $x_1 + x_2 \le 4$ 

$$x_1 - x_2 \le 2$$
 and  $x_1, x_2 \ge 0$ 

Write the Algorithm Steps for simplex Method

7

**(7)** 

**(7)** 

## Q-3 Attempt all questions

**(14)** 

1 Apply MODI method and obtain basic feasible solution by VAM

	I	II	III	IV	Supply
A	5	2	4	3	22
В	4	8	1	6	15
C	4	6	7	5	8
Requirement	7	12	17	9	

# Find Initial Solution Using NWCM,LCM, & VAM Method

**(7)** 

	D1	D2	D3	D4	Supply
S1	19	30	50	10	7
S2	70	30	40	60	9
<b>S</b> 3	40	8	70	20	18
Demand	5	8	7	14	34

OR

# Q-3 1 Five Men are available to different five jobs find assignment the minimize

**(7)** 

total time

TIVE	ich aic	avanas	ic to unite	CIII II V C	յսսե առ	assignin
the	Job	I	II	III	IV	V
	Men					
	A	2	9	2	7	1
	В	6	8	7	6	1
	C	4	6	5	3	1
	D	4	2	7	3	1
	E	5	3	9	5	1

Write Advantage and disadvantages of Linear Programming

**(7)** 

#### **SECTION-II**

#### Q-4 Attempt the Following questions

(7)

What is Feasible Solution?Write the full form of PERT& CPM

1 2

3 What is Decision variables & objective Function

2

4 Full Form of AOA & AON

2



#### Q-5 Attempt all questions

(14) (7)

1 Obtain the optimal feasible solution by MODI Method

	W1	W2	W3	Supply
<b>F</b> 1	16	20	12	200
F2	14	8	18	160
F3	26	24	16	90
Demand	180	120	150	

Initial Basic Feasible Solution obtained by

NWCM.

2 Describe the transportation problem with its general mathematical formulation

**(7)** 

#### OR

**Q-5** 1 Give the mathematical formulation of an assignment problem.

(7)(7)

2

Man	I	II	III	IV	V
Job					
A	10	5	13	15	16
В	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

Department of company has five job with five man find total man hours to minimize the total time.

#### Q-6 Attempt all questions

(14)

1 A Research and development department break up is as follows

**(7)** 

Job	Immediate	Time	Job	Immediate	Time
	Predecessor	(Days)		Predecessor	(Days)
A		5	F	D	2
В	A	7	G	С	1
С	В	2	Н	E,F	3
D	В	3	I	G,H	10
E	C	1			

(1) Draw

the arrow diagram.

- (2) Identify the critical path and find the total project duration.
- 2 Explain events and Activities with suitable example.

**(7)** 

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# **Q-6**

**Attempt all Questions**Following table is given calculate the total estimation time, critical path, total and 1 **(7)** free float for each non critical activity.

Activity	Duration	Predecessor	Activity	Duration	Predecessor
A	6		G	2	
В	4	A	Н	10	G
C	7	В	I	6	J,H
D	2	A	J	13	
E	4	D	K	9	A
F	10	E	L	3	C,K
			M	5	I,L

2 Discuss Errors and Dummies in Network. **(7)** 

