THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

MCA 5422 **Optimization Technique**

Max:75mks **Time:3hours**

Answer any five questions **5*15=75**

1. Solve L.P.P Max $Z = 50x + 18y$ s.t $2x+y \leq 100$; $x + Y \leq 80$ .x,y ≥ 0

Using Graphical method.

2. Solve L.P.P Max $z= 4x+10y$ s.t $2x+y \leq 50$; $2x+5y \leq 100$ and $2x+3y \leq 90$ and $x,y \geq 0$ By Simplex method.

3. . Solve the L.P.P Minimize $Z = 3x_1 + x_2$

Subject to constraints $4x_1 + x_2 = 4$; $5x_1 + 3x_2 \geq 7$, $3x_1 + 2x_2 \leq 6$ where $x_1 , x_2 \geq 0$ by Big-M method

4. Solve the L.P.P MINIMIZE: $Z = 3\ X1 + 2\ X2$ subject to

$2\ X1 + 1\ X2 \leq 2$; $3\ X1 + 4\ X2 \geq 12$ and $x,y \geq 0$. By Two-Phase method.

5. Solve the T.P.P

	W1	W2	W3	W4	W5	Supply
F1	13	9	15	10	12	40
F2	11	10	12	12	9	10
F3	12	9	11	12	9	20
F4	13	12	13	12	10	10
Demand	12	15	20	15	18	

6. Obtain i.critical path ii. Project duration iii.project variance

ACTIVITY	IMMEDIATE PREDECESSOR	OPTIMISTIC TIME (o)	MOST PROBABLE TIME (m)	PESSIMISTIC TIME (p)
A	-	4	5	6
B	-	6	8	10
C	A	6	6	6

D	B	3	4	5
E	B	2	3	4
F	C,D	8	10	12
G	E	6	7	8
H	C,D	12	13	20
I	F,G	10	12	14

7. Arrival s at a telephone booth are considered to be Poisson with an average time Of 10 minutes between arrival and the next . The length of a phone call is Assumed to be distributed exponential , with mean 3 minutes.

i.What is the probability that a person arriving at the booth wil

have to wait

ii. What is the average length of the queue that form from time to

time?