Q. Code: 546282

Reg. No. | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019

Sixth Semester

EE16007 – OPTIMIZATION TECHNIQUES

(Electrical and Electronics Engineering)

(Regulation 2016)

Time: Three Hours **Maximum : 100 Marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

		CO	RBT
1.	Define a feasible region.	1	R
2.	What are the methods used to solve an linear programming problems (LPP)?	1	R
3.	What is meant by optimality test in a dual simplex method?	2	R
4.	Discuss the advantages of revised simplex method over the the ordinary simplex method.	2	U
5.	What is the objective of the travelling sales man problems?	3	R
6.	What is the purpose of MODI method?	3	R
7.	How bordered hessian matrix is helping to find the stationary point is weather maximum or minimum?	4	U
8.	What is the difference between linear and nonlinear programming problem?	4	R
9.	How dummy activity is useful in a network diagram?	5	U
10.	What are the three main phases of a project?	5	R

PART B - (5 X16 = 80 Marks)

11.	(a)	Solve the following LPP by the graphical method. Max $Z = 3X_1 + 2X_2$ Subject to $-2X_1 + X_2 \leq 1$ $X_1 \leq 2$ $X_1 + X_2 \leq 3$ and $x_1, x_2 \geq 0$	**(16)**	**1**	**AP**
		(OR)			
	(b)	A firm manufactures two types of products A & B and sells them at a profit of Rs 2 on type A and Rs 3 on type B. Each product is processed on two machines M1 and M2. Type A requires1 minute of processing time on M1 and 2 minutes on M2. Type B requires 1 minute on M1 and 1 minute on M2. Machine M1 is available for not more than 6hours 40 minutes while machine M2 is available for 10 hours during any working day. Formulate the problems as a LPP so as to maximize the profit.	**(16)**	**1**	**AP**

12. (a) Using dual simplex method solve LPP **(16) 2 AP**

Maximize $Z = 6x_1+4x_2+ 4x_3$

Subject to

$3X_1+X_2+2X_3 \geq 2$

$2X_1+X_2 -X_3 \geq 1$

$-X_1+X_2+2X_3 \geq 1$

(OR)

(b) List the steps involved in the revised simplex method. **(16) 2 R**

13. (a) Find the starting solution of the following transportation model. **(16) 3 AP**

Using (I) NWC (ii) LCM (iii) VAM

1	2	6	**7 Demand**
0	4	2	**12** ↓
3	1	5	**11** ↓
10	**10**	**10**	← **Supply**

(OR)

(b) Explain the steps in the Hungarian method used for solving assignment problems. **(16) 3 R**

14. (a) Use the Lagrange multiplier method to solve the following non-linear programming problem, Does the solution maximize or minimize the objective function? **(16) 4 AP**

Objective function

$F(x) = 2X_1^{\ 2} +X_2^2+3X_3^2+10X_1+8X_2+6X_3-100$

Subject to

$X_1+X_2+X_3 = 20$

$X_1, X_2, X_3 \geq 0$

(OR)

(b) Discuss the procedure for solving the nonlinear programming problem using Kuhn-Tucker method. **(16) 4 R**

15. (a) Discuss in details about CPM and PERT. **(16) 5 R**

(OR)

(b) Discuss in details about maximum flow algorithm. **(16) 5 R**