TM142150A **Reg. No……...……..**
Name :……..

M.COM DEGREE (CSS) EXAMINATION, APRIL 2015
SECOND SEMESTER- CORE COURSE (COMMERCE)
COM2OR-OPERATIONS RESEARCH

Time:Three Hours **Maximum Weight:30**

PARTA

I. Answer any *FIVE* questions. Each question carries *1* weight

1. What is Operations Research?
2. What is Linear Programming?
3. What is a slack variable?
4. What is a feasible solution in Transportation Problem?
5. What are the features of Assignment Problem?
6. What is a Saddle point?
7. What is a Queuing Theory?
8. What is a successor activity?

(5x1=5)

PART B

II. Answer any *FIVE* questions. Each answer not to exceed two pages
Each question carries *2* weights

9. Explain the Phases of OR study
10. Solve the following by graphical method

    Minimize Z =20x1+40x2

    Subject to:36x1+6x2≥ 108

    3x1+12x2 ≥36

    20x1+10x2 ≥100

    And x1,x2≥0

11Explain Vogel's Approximation Method

12.ExplainMODI method of solving Transportation problem

13. Compare decision making under conditions of uncertainty with that under risk

14. Distinguish between PERT and CPM

15. Find the value of the following Game

		Firm B				
		1	2	3	4	5
	1	3	-1	4	6	7
Firm A	2	-1	8	2	4	12
	3	16	8	6	14	12
	4	1	11	-4	2	1

16. The demand for a seasonal product is given below:

Demand:	40	45	50	55	60	65
Probability:	0.10	0.20	0.30	0.25	0.10	0.05

The product costs Rs.60 per unit and sells at Rs.80 per unit. Determine the optimum number of units to be produced

(5x2=10)

PART C

III. Answer any *THREE* questions. Each question carries 5 weights

17. Explain about OR Models
18. Explain the features of Queuing Theory

19. Maximize $Z = 45x_1 + 80x_2$

Subject to: $5x_1 + 20x_2 \leq 400$

$10x_1 + 15x_2 \leq 450$

$x_1, x_2 \geq 0$

20. A project schedule has the following characteristics:

Activity	Time
1-2	4
1-3	1
2-4	1
3-4	1
3-5	6
4-9	5
5-6	4
5-7	8
6-8	1
7-8	2
8-10	5
9-10	7

Draw a PERT network and find the critical path

21. The following table lists the job s of a network along with their time estimates

Job	Optimistic time	Most likely time	Pessimistic time
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

Draw the projectnetwork; find the criticalpath, earliest and latest time for all events, slack and total float, free float and independent float

22. A company has three plants A, B, C and three ware houses X,Y,and Z. The number of units available at the plants is 60, 70, and 80 respectively. The demands at X, Y and Z are 50, 80, and 80 respectively. The unit cost of transportation is given below.

	X	Y	Z
A	8	7	3
B	3	8	9
C	11	3	5

Find the allocation so that the total transportation cost is minimum

23. A departmental 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 given below:

	MEN			
TASKS	E	F	G	H
A	36	52	34	22
B	26	56	28	52
C	76	38	36	30
D	38	52	48	20

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

(3x5=15)