(i) Printed Pages: 3 Roll No. .....

(ii) Questions : 10 Sub. Code : 3817

Exam. Code : 0502

Master of Commerce 2nd Semester

1059

OPERATIONS RESEARCH

(Same for USOL Candidates)

Paper : M.C. 205

Time Allowed : Three Hours] **[Maximum Marks : 80**

Note :— Attempt any **five** questions. Each question carries equal marks.

1. Define Operations Research. Describe its characteristics and limitations.
2. Upon completing the construction of his house Mr. Natragen discovers that 700 square feet of plywood scrap and 80 square feet of white pine scrap are in unsaleable form for the construction of tables and book cases. It takes 16 square feet of plywood and 8 square feet of white pine to make a table; 12 square feet of plywood and 16 square feet of white pine are required to construct a book case. By selling the finished products to a local furniture store Mr. Natragen can realise a profit of Rs. 25 on each table and Rs. 20 on each book case. How may he most profitably use the left-over wood ? Use Graphical Method to solve the problem.

3. Solve by Simplex method :

Maximize : $Z = 3X_1 + 5X_2 + 5X_3$

subject to restrictions :

$$0.1X_1 + 0.25X_2 + 0X_3 \leq 120$$

$$0.20X_1 + 0.30X_2 + 0.40X_3 \leq 260$$

$$X_1, X_2, X_3 \geq 0$$

4. Explain Vogel's approximation method to find initial basic feasible solution in transportation problem and then describe sequence of steps in MODI method to check its optimality.

5. Solve the transportation problem and test the optimality :

	C_1	C_2	C_3	C_4	Supply
W_1	14	28	20	16	60
W_2	14	24	22	12	80
W_3	10	30	16	18	60
Demand	40	50	40	60	190 / 200

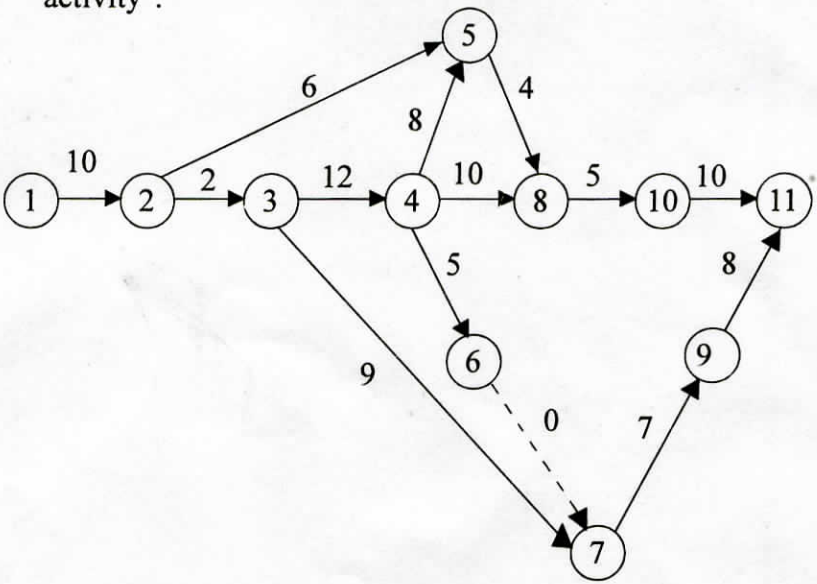
6. Five jobs are to be processed and five machines are available. Any machine can process any job with resulting profit (in rupees) as follows :

Jobs	Machines				
	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Find the assignment pattern that maximises the sales.

7. Why is replacement of items replaced ? Distinguish between individual replacement and group replacement policy.

8. Obtain the critical path and project duration for the following PERT network. Also obtain total and free float for each activity :



9. What is a queue ? Give an example and explain the basic elements of queues.

10. Reduce the following game by dominance and find the game value :

		B			
		I	II	III	IV
A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8