

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.) Degree Course 2016-17**

Semester	: VII (New Syllabus)	Academic Year	: 2016-2017
Course No.	: ST-702	Course Title	: Operation Research
Credits	: 2+0=2	Total Marks	: 50
Day & Date	: Tuesday, 03/01/2017	Time	: 11.00 to 13.00 Hrs.

- Note :**
- 1) All questions from **Section 'A'** are compulsory.
  - 2) Solve **Any Five** questions from **Section 'B'**.
  - 3) Draw neat and well labeled diagram wherever necessary.

**SECTION –‘A’**

Q. 1 A) Choose the most appropriate answer from the options given below. (05)

- i) Penalty means .....
  - a) Difference between two highest costs in a row/column
  - b) Difference between two lowest costs in the transportation matrix
  - c) Difference between two adjacent cells in arrow/ column
  - d) Difference between two lowest cost in a row/ column
- ii) Which of the following is not true for 'initial feasible solution' in transportation problems?
  - a) The rim conditions are satisfied
  - b) The transportation problem is a balanced one.
  - c) It gives the minimum transportation cost.
  - d) None of the above.
- iii) Following is not an ordering cost .....
  - a) Salary of purchase staff
  - b) Material Handling cost
  - c) Purchase follow up expenses
  - d) Cost of Bills Payment
- iv) In simplex table, the variables which appear as 'current solution' are called .....
  - a) Basic variables
  - b) Slack variables
  - c) Decision variables
  - d) Surplus variables
- v) The SDE (scarce, difficult and Easy) classification of inventory is based on .....
  - a) Availability of items
  - b) Annual Monetary Value of items
  - c) Price of items
  - d) Annual Usage of items

B) Write the full form of the following. (05)

- i) LPP
- ii) VAM
- iii) PERT
- iv) NWCM
- v) CPM

(P.T.O.)

- Q. 2 A) Explain the following in one sentence. (05)
- Constraints
  - Optimization
  - Optimal Solution
  - Feasible Solution
  - Operation Research
- B) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)
- A loop in transportation problem always Start and end at occupied cell
  - In a transportation problem, numbers in each cell indicate distance.
  - At EOQ, the holding cost is always equal to the ordering cost
  - In assignment problems, there can be more than one optimum assignment.
  - A project critical path cannot indicate the project's completion time.

### SECTION –'B'

- Q. 3 Explain the models of operation research (06)
- Q. 4 Following table gives the data of time taken to pressure-cook various food items. There are four different type of cookers available. Make an ASSIGNMENT which will Minimize the total time for cooking all the items. (06)

	Cooker type			
	I	II	III	IV
Beans	10	5	6	10
Peaches	6	2	4	6
Tomatoes	7	6	5	6
Corn	9	5	4	10

- Q. 5 A project consists of following activities. Draw Network and find Critical Path & Project completion time and Find slack activities. What is the probability that the project will be completed in less than 18 day? (06)

Activity	Predecessor	Durations in days		
		a	m	b
A	-----	4	7	13
B	A	6	9	11
C	A	5	7	9
D	B	3	5	7
E	C	7	8	10
F	D	2	3	5
G	E	6	7	8
H	F,G	2	3	4

- Q. 6 a) What is the difference between PERT and CPM in project networking? (02)
- b) Describe briefly the scope of Operations Research in a dairy plant. (02)
- c) Explain the objective of LPP. (02)
- Q. 7 a) Write and explain the Hungarian Method in details. (03)
- b) Explain briefly the ABC inventory control technique. (03)
- Q. 8 a) Explain the 'Ordering costs' involved in inventory management. (02)
- b) Explain the characteristic of Operation Research. (02)
- c) Differentiate row and column deduction. (02)
- Q. 9 a) Explain the 'Holding costs' involved in inventory management. (02)
- b) Explain in details the principle of Operation Research. (04)