

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMEISTER END THEORY EXAMINATION, B. Tech. Dairy Technology 2019-20

Semester	: V (V Dean)	Academic Year	: 2019-2020
Course No.	: DBM-507	Course Title	: ICT in Dairy Industry and Operation Research
Credits	: 2+2=4	Total Marks	: 50
Day & Date	: Tuesday, 14.01.2020	Time	: 11.00 to 13.00 Hrs.

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

SECTION - 'A'

Q.1 A) Choose the most appropriate answer form the option given below. (05)

- i) Operations research is the application of methods to arrive at the optimal solutions to the problems.
 - a) Economical
 - b) Artistic
 - c) Scientific
 - d) financial
- ii) In graphical representation the bounded region is known as region.
 - a) Solution
 - b) Optimal
 - c) Basic solution
 - D Feasible solution
- iii) For the constraint of greater the equal to type we make use of variable.
 - a) Slack
 - b) Surplus
 - c) Artificial
 - d) Basic
- iv) If an artificial variable is preset in the basic variable column of optimal simplex table
 - a) Unbounded
 - b) Optimal
 - c) Infeasible
 - d) Basic
- v) The maximization or minimization quantity is the
 - a) Goal of Management system
 - b) Objective of operation research
 - c) Constraint of operation research
 - d) None of Above

B) Define the following. (05)

- i) Operation Research
- ii) Feasible solution
- iii) Slack variables
- iv) Artificial variables
- v) Merge Event

Q.2 A) Give reasons for the following.

- i) Critical path is important PERT and CPM.
- ii) When added dummy column in Assignment Problem.
- iii) Why is optimization important?
- iv) Why dummy variable is added in linear programming?
- v) Why supply is equal to demand for solving transportation problem.

(P.T.O.)

- B) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)
- All tasks on the critical path of a project schedule have their latest finish time equal to their earliest finish time.
 - At each iteration of the Hungarian method, the original cost matrix is replaced with a new cost matrix having the same optimal assignment.
 - Penalty in transportation problem is difference between highest & lowest element of row/column
 - To balance the unbalanced transportation problem, penalty must be added.
 - During World War II, the military management in UK & USA engaged a team of scientist in plan under the name transportation problem.

SECTION - 'B'

- Q.3 A) Give the algorithm of LCM to obtain basic feasible initial solution to transportation problem. (05)
- B) Obtain the initial solution to following TP using northwest corner method. (05)

	D1	D2	D3	D4	Supply
O ₁	6	4	1	5	14
O ₂	8	9	2	7	16
O ₃	4	3	6	2	5
Demand	6	10	15	4	

- Q.4 A) A manufacturer has two machines A and B. He manufactures two products P and Q on these two machines. For manufacturing product P he has to use machine A for 3 hours and machine B for 6 hours, and for manufacturing product Q he has to use machine A for 6 hours and machine B for 5 hours. On each unit of P he earns Rs 14 and on each unit of Q he earns Rs 10. How many units of P and Q should be manufactured to get the maximum profit? Each machine cannot be used for more than 2100 hours. Formulate as LPP. (05)
- B) Explain the various models in operation research (05)
- Q.5. A) Write down any two scopes of operation research. (03)
- B) What is Linear programming problem? (03)
- C) Write short note on inventory problem. (04)
- Q.6 A) Explain the sequencing problem? (03)
- B) Explain the step involved to solve the Assignment Problem (03)
- C) Differentiate between LCM & VAM (04)
- Q.7 A project consists of following activities. Draw Networking and find Critical path and project completion time. (10)

Activity	A	B	C	D	E	F	G	H
Predecessor	-	A	A	B	C,D	D,E	F	F,G
Durations in days	1	1	1	2	3	3	1	2
