

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
