TB146275A **Reg. No…….**

Name……....

B. Sc. DEGREE (C.B.C.S.S.) EXAMINATION, MARCH 2017

SEMESTER VI - COMPUTER APPLICATIONS

CA6OR-OPERATONS RESEARCH

Time: Three Hours **Maximum Marks: 80**

PART A

I. Answer all questions. Each question carries 1 mark.

1. What are the different phases in OR?
2. Define Iconic Model.
3. Mention any two limitations of OR.
4. Define Objective function.
5. State the Fundamental theorem of Duality.
6. Define Loop in a Transportation Table.
7. Give Mathematical formulation of Assignment Problem.
8. Name the basic components of Network.
9. What is Critical Path?
10. What is Independent Float?

(10x1=10)

PART B

II. Answer any eight questions. Each question carries 2 marks.

11. State three OR models which have wide applications.
12. Explain the role of computers in OR.
13. Briefly describe the scope of OR.
14. Explain Monte-Carlo Method.
15. Define Slack and Surplus variables in LPP.
16. Write the general form of LPP.
17. Establish the difference between feasible solution and basic feasible solution.
18. How will you solve degeneracy in Transportation problem?
19. Differentiate between Transportation problem and Assignment problem.
20. Write the rules for Network construction.
21. Explain Optimistic and Pessimistic times.
22. What do you mean by Looping and Dangling in Network? **(8x2=16)**

PART C

III. Answer any six questions. Each question carries 4 marks.

23. Explain the main characteristics of a good model.
24. Explain some applications of OR.

25. Use Graphical method to solve the LPP.

Maximise $Z = X_1 + 2X_2$

Subject to : $X_1 - X_2 \leq 1$

$X_1 + X_2 \geq 3$

$X_1, X_2 \geq 0$

26. An animal feed company must produce 200 lbs of a mixture containing the Ingredients X_1 and X_2. X_1 costs Rs.3 per lb and X_2 costs Rs.8 per lb. Not more than 80 lbs of X_1 can be used and minimum quality to be used for X_2 is 60 lbs. Formulate the above problem to minimise the cost.

27. Find the initial basic feasible solution by VAM.

Source / Destination	A	B	C	D	Availability
1	20	22	17	4	120
2	24	37	9	7	70
3	32	37	20	15	50
Requirement	60	40	30	110	

28. Explain Hungarian method of solving Assignment problem.
29. Compare CPM and PERT.
30. Explain Critical Path analysis.
31. Draw the network of the following project.

Activity	Immediate predecessor	Estimated Time
A	-	2
B	A	3
C	A	4
D	B, C	6
E	-	2
F	E	8

(6x4=24)

PART D

IV. Answer any two questions. Each question carries 15 marks.

32. Use Simplex method to solve the LPP.

Maximise $Z = 4X_1 + 10X_2$

Subject to: $2X_1 + X_2 \leq 50$

$2X_1 + 5X_2 \leq 100$

$2X_1 + 3X_2 \leq 90$

$X_1, X_2 \geq 0$

33. Use Big M Method to solve the LPP.

Maximise $Z = 6X_1 + 4X_2$

Subject to : $2X_1 + 3X_2 \leq 30$

$3X_1 + 2X_2 \leq 24$

$X_1 + X_2 \geq 3$

$X_1, X_2 \geq 0$

34. Solve the Assignment problem to maximise the total sales.

Salesman	Annual Sales in thousands			
	I	II	III	IV
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12

35. Draw the network for the data given below and compute :

(1) Critical path (2) Total project duration (3) total float

Activity	A	B	C	D	E	F	G	H	I
Predecessor	-	-	-	A	B	C	D, E	B	H, F
Duration	3	5	4	2	3	9	8	7	9

(2x15=30)