



19101563

QP CODE: 19101563

Reg No : .....

Name : .....

**BSC DEGREE (CBCS) EXAMINATION , MAY 2019**

**Fourth Semester**

B.Sc Computer Science Model III

Core Course - CC4CRT03 - COMPUTER AIDED OPTIMIZATION TECHNIQUES

2017 ADMISSION ONWARDS

81DC6BCD

**Maximum Marks: 80**

**Time: 3 Hours**

**Part A**

Answer any **ten** questions.

Each question carries **2** marks.

1. Explain the nature of OR ?
2. Give some limitations of OR ?
3. What are the components of an LPP
4. What are the characteristics of dual problem?
5. What is the condition to evaluate a transportation problem and how can we overcome from this?
6. What is the condition for evaluate an assignment problem and how can we overcome from this?
7. If number of assignment is not equal to the n [the order of cost matrix]. Then what are the steps involved to make it equal?
8. What do you mean by total elapsed time in sequencing problem?
9. What do you mean by no passing rule in sequencing problems?
10. What are the features of network flow models?
11. Define max flow- mini cut.
12. What is network scheduling?

(10×2=20)

**Part B**

Answer any **six** questions.

Each question carries **5** marks.

13. Explain the characteristics of LPP.
14. Explain the basic assumptions in LPP.
15. Solve graphically,  
Minimize  $Z=3x_1 + 5x_2$   
Subject to,  $-3x_1 + 4x_2 \leq 12$   
 $2x_1 - x_2 \geq -2$   $2x_1 + 3x_2 \geq 12$   
 $x_1 \leq 4$   $x_2 \geq 2$   
 $x_1, x_2 \geq 0$





16. A timber company ships pine flooring to three building supply houses from its mills in bhunya,mondi and pigg's peak. Determine the best transportation schedule for the data given below using the north west corner method.

	SUPPLY HOUSE 1	SUPPLY HOUSE 2	SUPPLY HOUSE 3	MILL CAPACITY(TONS)
BHUNYA	3	3	2	25
MONDI	4	2	3	40
PIGG'S PEAK	3	2	3	30
SUPPLY HOUSE DEMAND(TONS)	30	30	35	95

17. Explain the steps of assignment problem with example
18. Explain Shortest Route Problem
19. A machine shop has four machines A ,B ,C and D. Two jobs must be processed through each of these machines. The time (in hours) taken on each of the machines and the necessary sequence of jobs through the shop are given below: Obtain the total elapsed time.
- Machines  
 Job 1 Sequence A B C D  
                   Time 2 4 5 1  
 Job 2 Sequence D B A C  
                   Time 6 4 2 3
20. Solve graphically,  
 Maximize  $Z=8X_1 + 6X_2$   
 Subject to,  
 $4X_1 + X_2 \leq 60$   
 $2X_1 + 4X_2 \leq 48$   
 $X_1, x_2 \geq 0$
21. Briefly explain the limitations of network techniques

(6×5=30)

### Part C

Answer any **two** questions.

Each question carries **15** marks.

22. Explain about the applications of OR ?
23. Apply principle of duality to solve the LPP.  
 Minimize  $Z=2x_1 + 2x_2$   
 Subject to,  
 $2x_1 + 4x_2 \geq 1$   
 $x_1 + 2x_2 \geq 1$   
 $2x_1 + x_2 \geq 1$   
 $x_1, x_2 \geq 0$
- Minimize  $Z= x_1 + x_2 + x_3$   
 Subject to,  
 $9x_1 + 5x_2 \geq 1$   
 $x_1 + 6x_2 + 2x_3 \geq 1$





$$4x_1 + 3x_2 + 8x_3 \geq 1$$

$$x_1, x_2, x_3 \geq 0$$

24. Use the north-west corner method to find an initial solution to the problem described below.

	E	F	G	H	supply
A	180	110	130	290	14
B	190	250	150	250	16
C	290	290	190	120	20
	11	15	19	10	

25. The data for small project is given below.

Activity : A B C D E F  
Optimistic time (days) : 9 14 16 24 28 18  
Most likely time (days) : 10 20 20 30 36 20  
Pessimistic time (days) : 14 26 22 36 46 21  
Precedence relationship is: A<C, D; B<C, D; C<E; D, E<F  
Find the expected activity time and their variances. Calculate the earliest and latest expected time to reach each node. What is the probability that the project will be completed 2 days earlier than expected?

(2×15=30)

