



QP CODE: 21103031

21103031

Reg No :

Name :

B.Sc/BCA DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

Fourth Semester

Complementary Course - MM4CMT03 - OPERATIONS RESEARCH

(Common for B.Sc Cyber Forensic and Bachelor of Computer Applications)

2019 Admission only

68452C47

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What is operation research?
2. Explain the nature of operation research.
3. Describe the use of OR in Transport.
4. Briefly describe some application of operation research in functional areas of management.
5. What is a linear programming problem?
6. What do you mean by unbounded solution?
7. What are artificial variables and why are they introduced?
8. Write the mathematical model for the transportation problem given below:

Cost of transportation in Rupees

Destinations				
Sources	D1	D2	D3	D4
O1	C ₁₁	C ₁₂	C ₁₃	a ₁
O2	C ₂₁	C ₂₂	C ₂₃	a ₂
O3	C ₃₁	C ₃₂	C ₃₃	a ₃
Demand	b ₁	b ₂	b ₃	

9. What you mean by degeneracy in transportation problem?
10. Define assignment problem.





11. Define pay off matrix.
12. What do you mean by zero sum game?

(10×2=20)

Part B

*Answer any six questions.
Each question carries 5 marks.*

13. Explain the nature of operation research and its limitation.
14. Differentiate between deterministic model and probabilistic model.
15. Solve the following problem graphically

$$\begin{aligned} \text{Max } Z &= 3x_1 + 4x_2 \\ \text{Subject to } x_1 + x_2 &\leq 450 \\ 2x_1 + x_2 &\leq 600 \\ x_1 \geq 0, x_2 &\geq 0 \end{aligned}$$

16. Solve the following problem by simplex method

$$\begin{aligned} \text{Max } Z &= 3x + 5y \\ \text{Subject to } 3x + 2y &\leq 18 \\ x &\leq 4 \\ y &\leq 6 \\ x \geq 0, y &\geq 0 \end{aligned}$$

17. Find the initial basic feasible solution of the following transportation problem using the Least cost method.

	D1	D2	D3	D4	Supply
O1	6	4	1	5	14
O2	8	9	2	7	16
O3	4	3	6	2	5
Demand	6	10	15	4	35

18. Obtain an initial basic feasible solution of the following T P using VAM

Destinations					
Sources	1	2	3	4	Supply
1	21	16	15	3	11
2	17	18	14	23	13
3	32	27	18	41	19
Demand	6	10	12	15	

19. Write the difference between a transportation problem and an assignment problem?





20. For what values of m , the game with the following matrix is determinable?

$$\begin{matrix} & \text{Player B} \\ \text{Player A} & \begin{bmatrix} m & 6 & 2 \\ -1 & m & -7 \\ -2 & 4 & m \end{bmatrix} \end{matrix}$$

21. In a game matching coins with two players, suppose A wins one unit of value when there are two heads, wins nothing when there are two tails and loses $1/2$ unit of value when there is one head and one tail. Determine the pay off matrix, best strategies and value of the game.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **15** marks.

22. a) An animal feed company must produce at least 200kgs of a mixture consisting of ingredients X_1 and X_2 daily. X_1 costs Rs.3 per kg and X_2 Rs.8 per kg. No more than 80 kg of X_1 can be used and atleast 60 kgs of X_2 must be used. Formulate a mathematical model to the problem. Solve it graphically.

b) Explain the applications of LPP in industry and management.

23. Solve the following assignment problem

	I	II	III	IV	V
A	1	3	2	3	6
B	2	4	3	1	5
C	5	6	3	4	6
D	3	1	4	2	2
E	1	5	6	5	4

24. The owner of a small machine shop has four machines available to assign to jobs for the day. Five jobs are offered with expected profit in Rupees for each machines on each job as follows:

		Jobs				
Machines	A	B	C	D	E	
1	62	78	50	101	82	
2	71	84	61	73	59	
3	87	92	111	71	81	
4	48	64	87	77	80	

Determine the assignment of machines to jobs that will result in a maximum profit.





25. (a) Explain the principle of dominance in game theory.
(b) Following is the pay off matrix for the players A and B

	Player B				
<i>Player A</i>	2	4	3	3	4
	5	6	3	7	8
	6	7	9	8	7
	4	2	8	4	3

(2×15=30)





21102790

QP CODE: 21102790

Reg No :

Name :

BCA DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

Fourth Semester

Bachelor of Computer Applications

Core Course - CA4CRT03 - SYSTEM ANALYSIS AND SOFTWARE ENGINEERING

2019 Admission only

FF51AA2C

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What are the purpose of Organization Chart?
2. Write any two characteristics of Computer Information System.
3. Explain the term reusability of components in a software.
4. Distinguish between generic and customized products.
5. Explain SDD.
6. How do we cancel a project with least work?
7. What is data dictionary?
8. What is Hardware interface?
9. What do you mean by Pseudocode?
10. Define reliability.
11. What is software testing?
12. What is unit testing?

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. distinguish between feedback and control. How do they relate to the concept of exception reporting?
14. Explain life-cycle activities.
15. Compare Water fall model and proto typng models.
16. What is Facilitated Application Specification Techniques?
17. What is Function count?
18. Explain the objectives of modular softwre design .What are effects of module cuopling and cohesion?
19. What documents should be produced on completion of the design phase?
20. Explain flow graph with an example.
21. Explain path testing.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. With a neat diagram explain the spiral model?
23. Explain the various models in COCOMO.
24. Explain the two part design process with diagram.
25. Discuss in detail about any three techniques to design test cases.

(2×15=30)





21102789

QP CODE: 21102789

Reg No :

Name :

B.Sc/BCA DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

Fourth Semester

Core Course - CS4CRT09 - DESIGN AND ANALYSIS OF ALGORITHMS

(Common for B.Sc Information Technology Model III & Bachelor of Computer Applications)

2019 Admission only

DDA82AD0

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

Each question carries 2 marks.

1. List of various algorithm design strategies.
2. What is performance measurement?
3. Write down the control abstraction for divide and conquer.
4. Illustrate the tree structure of mergesort algorithm of 10 elements.
5. Quicksort is more efficient than mergesort. Judge your answer.
6. What is subset paradigm?
7. Define feasible solution and optimal solution.
8. What is dynamic programming?
9. Explain all pair shortest path.
10. Explain single source shortest path.
11. What is an articulation point in a graph?
12. Draw a graph that contain hamiltonian circuit.

(10×2=20)

Part B

*Answer any **six** questions.*

Each question carries 5 marks.

13. What are the conditions to be satisfied by an algorithm?
14. Compare best case, worst case and average case complexity.





15. Explain the divide and conquer MaxMin algorithm.
16. Write a note on knapsack problem with algorithm.
17. Explain Kruskal's algorithm with necessary graph.
18. Write the algorithm for 0/1 knapsack problem with example.
19. Describe Travelling Sales Persons problem.
20. What are basic traversal techniques? Explain with algorithm.
21. Draw the state space tree to generate the first solution to 4 queens problem.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Differentiate space complexity and time complexity of algorithms with example.
23. Explain Strassen's Matrix Multiplication problem with an example.
24. What is Minimum Cost Spanning tree? Explain the Kruskal's Minimum Cost Spanning tree with suitable example.
25. Explain the algorithm for finding m-colorings of a graph.

(2×15=30)





QP CODE: 21103000



21103000

Reg No :

Name :

B.Sc/BCA DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

Fourth Semester

Core Course - CS4CRT10 - LINUX ADMINISTRATION

(Common for B.Sc Computer Applications Model III Triple Main, B.Sc Computer Science Model III, B.Sc Information Technology Model III, Bachelor of Computer Applications)

2019 Admission only

EA4A842A

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

Each question carries 2 marks.

1. Which are the major types of shells?
2. What is the difference between home directory and working directory?
3. Which are the commands used to create files in Linux?
4. Define kill and killall commands.
5. Explain the command : `$ find /home/Steve -name "jan"`
6. How can you find the product of two numbers using expr command in Linux?
7. What is shell environment?
8. Give syntax of case statement.
9. Distinguish between groupmod -g and groupmod -n command in Linux.
10. Define mount point.
11. What is a filter?
12. What is samba?

(10×2=20)

Part B

*Answer any **six** questions.*

Each question carries 5 marks.

13. Explain features of Linux operating system.





14. Write short note on Linux Standard Directories.
15. Explain scheduling of a process with cron command.
16. What are editors? Explain vi editors.
17. Describe the use of conditional statement in shell scripts with suitable example.
18. Explain different types of variables in shell script.
19. Discuss the various process of system performance monitoring.
20. What is DNS Server?
21. Explain FTP in Detail.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain any five file processing commands in Linux with its syntax and suitable examples.
23. a) Explain function in shell with suitable example. How will you pass parameters in shell?
b) Write a shell script to copy all files with .c extension in the current working directory to a subdirectory.
24. Explain the common administrative tasks in Linux.
25. Write a note on Apache Server.

(2×15=30)

