

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL

(An Autonomous and Re-Accredited with 'A' Grade by NAAC)

MCA (III semester) Examination, February 2014

Subject : Operating System
Sub. Code : MCA 11304

Exam Time : 3 hrs

Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT-I

1. a) What are the major activities of operating system in regard to process – management, memory management?
b) Briefly explain about the following:
i) System call ii) Thread
c) Explain about process control block.

OR

2. a) Describe the actions taken by a Kernel to context switch.
i) Among threads ii) Among process
b) What is a dispatcher? What are its functions?
c) What are the benefits of the virtual machine concept? Explain.

UNIT-II

3. a) With the help of suitable example and diagram, explain the concept of “Segmentation with paging”
b) Discuss the contiguous, linked and indexed methods of allocating disk space.
c) Explain the following allocation algorithms.
i) First-Fit ii) Best-Fit iii) Worst-Fit

OR

4. a) What is a working set model?
b) What is a page Fault? How does the operating system handle this situation? Explain.
c) Explain about the following:
i) File structure ii) Directory structure

UNIT-III

5. a) Explain about critical section problem?
b) Briefly explain different mechanisms for recovery from deadlocks.
c) What are monitors? How can a monitor solution be provided to the “dining-philosopher” problem? Briefly explain.

OR

6. a) Write Bankers algorithm for deadlock avoidance.
b) Explain how the domain structure can be used to provide protection.
c) Explain the following
i) threat monitoring ii) Authentication

UNIT-IV

7. a) Write short notes on the following:
i) Buffering ii) Caching iii) Spooling and device reservation
b) Explain about Disk Formatting.
c) Discuss about swap space management.

OR

8. a) Explain structure of the stream.
b) How is reliability improved via redundancy? Explain the various RAID levels and improvement in performance via parallelism.

UNIT-V

9. a) Discuss the input and output system in linux by using the overall structure of the device-driver.
b) What are the main layers and subsystems of windows XP? Explain the architecture with diagram.

OR

10. a) Explain the windows NT architecture.
b) Explain the services provided by the windows kernel.

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL
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MCA (IV semester) Examination, February 2014

Subject : Web Programming
Sub. Code : MCA 11404

Exam Time : 3 hrs
Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT - I

1. a) Give nested ordered list.
b) Explain external style sheet.

10M
10M

OR

2. a) Create image as hyperlink.
b) Create text as hyperlink.
c) Explain font tag.

6M
6M
8M

UNIT-II

3. a) Explain ONFOCUS, ONBLUR events.
b) Explain object hierarchy.

10M
10M

OR

4. Explain TDC binding to IMG tag.

20M

UNIT-III

5. Give string functions in Java Script with example.

20M

OR

6. Write a java script program for Binary search using Arrays.

20M

UNIT-IV

7. a) Explain I/O in VB script.
b) Explain IIS.

10M
10M

OR

8. Give the math functions in VB script.

20M

UNIT - V

9. Explain ADO and file system objects in ASP

20M

OR

10. Explain server side includes.

20M

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL

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MCA (III semester) Examination, February 2014

Subject : Design & Analysis of Algorithm
Sub. Code : MCA 11303

Exam Time : 3 hrs
Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT-I

1. a) Write an algorithm for finding minimum and maximum of a given list of numbers.
b) What is the time complexity of an algorithm? Explain with an example.

OR

2. a) What are randomized algorithms? Explain with an example?
b) Give the algorithm for binary search and determine its time complexity by the step count method.

UNIT-II

3. a) Explain the design of algorithm to determine the minimum spanning tree of a graph with greedy approaches.
b) Analyze Quick sort algorithm for average and worst case of sorting.

OR

4. Write an algorithm to generate shortest paths from a single source to all remaining vertices in the graph.

UNIT-III

5. a) Discuss about reliability design of a system composed of several devices connected in series using dynamic programming?
b) Discuss in detail about All-pairs shortest path problem?

OR

6. a) What is depth first search? Explain with an example?
b) Define the terms (i) Articulation point (ii) Biconnected graph
(iii) Biconnected component with suitable examples

UNIT-IV

7. a) What is branch and bound technique? Give an example?
b) Write an algorithm for 8-Queens problem?

OR

8. a) What is graph coloring? Explain with example.
b) Show the state space tree generated for the instance $n=6$, $m=30$ and $w(1...6)$ are $\{5, 10, 12, 13, 15, 18\}$ and explain the algorithm.

UNIT-V

9. a) Define the term 'Reducibility' and explain graph coloring problem can be reduced to clique decision problem.
b) Explain decision problem and optimization problem.

OR

10. Distinguish among P, NP, NP-hard and NP-complete classes of algorithms. Give a brief note on satisfiability of problem.

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL

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MCA (III semester) Examination, February 2014

Subject : Software Engineering

Sub. Code : MCA 11301

Exam Time : 3 hrs

Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT-I

1. a) Write short notes on software maintenance? 8M
- b) Describe the important characteristics of a software process? 12M

OR

2. a) Explain the advantages of prototyping model over waterfall model. 8M
- b) Summarize various phases of software life cycle in waterfall model? 12M

UNIT-II

3. a) Explain the desirable characteristics of an SRS? 8M
- b) Write short notes on the software requirements specification. 12M

OR

4. a) Describe the importance of software architecture? 10M
- b) Explain about pipe & filter style of architecture? 10M

UNIT-III

5. a) Explain bottom-up estimation Approach? 10M
- b) Describe the various activities in risk management? 10M

OR

6. a) Explain about different types of cohesion? 10M
- b) Discuss about detailed design? 10M

UNIT-IV

7. a) Give the importance of code inspection? 10M
- b) What is refactoring? Discuss the risks in refactoring? 10M

OR

8. a) Write short notes on levels of testing? 10M
- b) Describe the white-box testing with control flow based criteria? 10M

UNIT-V

9. a) Briefly discuss about re-engineering? 10M
- b) Explain about forward engineering? 10M

OR

10. a) Write short notes on SPI trends? 10M
- b) Give a brief note on people CMM? 10M

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL

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MCA (III semester) Examination, February 2014

Subject : DBMS
Sub. Code : MCA 11302

Exam Time : 3 hrs
Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT-I

1. Explain the following 4x5M=20M
- | | |
|----------------------|----------------------------|
| a) Class hierarchies | b) Aggregation in ER Model |
| c) Data Independence | d) Functional dependency |

OR

2. a) Differentiate between 'BCNF' and '3NF' 12M
b) Describe loss-less join decomposition with suitable examples. 8M

UNIT-II

3. Consider the following database 20M
- employee (eid, ename, ecity, sal)
company (cid, cname, ccity)
works (eid, cid)

Write queries for the following in Relational Algebra, Tuple Relational Calculus, Domain Relational Calculus and structured query language.

- a) Find the names of employees whose salary is greater than 2000
b) Find the details of the company which is located in 'Pune'.
c) Find the names of the employees who work in any company located in 'Hyderabad'.
d) Find the names of employees whose name starts with 'B' and has atleast 3 characters in it.
e) Find the names of employees who live in the same city, where the company in which he is working is located.

OR

4. a) Explain about operators of Relational Algebra in detail. 10M
b) Discuss about triggers. 10M

UNIT-III

5. Explain how B+ tree index handles search, insert, and delete operations with suitable examples. 20M

OR

6. a) Compare the file organizations. Explain. 14M
b) Give an overview of ISAM. 6M

UNIT-IV

7. a) Explain various two phase locking protocols. 10M
b) What are ACID properties of a transaction? Explain. 10M

OR

8. a) Write short notes on (i) Serializability (ii) Recoverability 12M
b) Explain with suitable example 'Thomas Write Rule' 8M

UNIT-V

9. a) Describe about Discretionary Access Control? 12M
b) Explain the role of statistical database in maintaining security. 8M

OR

10. Discuss about ARIES algorithm in detail. 20M

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL

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MCA (III semester) Examination, February 2014

Subject : Operation Research

Exam Time : 3 hrs

Sub. Code : MCA 11305

Max. Marks : 100

Answer the following questions

5 x 20M = 100M

UNIT-I

1. a) Define the terms (i) Optimum solution (ii) Unbounded solution 4M
b) Solve the following Linear programming problem using simplex method. 16M

$$\begin{aligned} \text{Maximize } z &= 3x_1 + 2x_2 + 5x_3 \\ \text{Subject to } &x_1 + x_2 + x_3 \leq 9 \\ &2x_1 + 3x_2 + 5x_3 \leq 30 \\ &2x_1 - x_2 - x_3 \leq 8 \\ &x_1, x_2 \text{ and } x_3 \geq 0 \end{aligned}$$

OR

2. a) Write the dual of the following LPP. 5M

$$\begin{aligned} \text{Minimize } z &= 3x_1 - 2x_2 + 4x_3 \\ \text{Subject to } &3x_1 + 5x_2 + 4x_3 \geq 7 \\ &6x_1 + x_2 + 3x_3 \geq 4 \\ &7x_1 - 2x_3 - x_3 \leq 10 \\ &x_1 - 2x_2 + 5x_3 \geq 3 \\ &4x_1 + 7x_2 - 2x_3 \geq 2 \\ &x_1, x_2 \text{ and } x_3 \geq 0 \end{aligned}$$

- b) Solve the following LPP using dual simplex method? 15M

$$\begin{aligned} \text{Minimize } z &= x_1 + 2x_2 + 3x_3 \\ \text{Subject to } &2x_1 - x_2 + x_3 \geq 4 \\ &x_1 + x_2 + 2x_3 \leq 8 \\ &x_2 - x_3 \geq 2 \\ &x_1, x_2 \text{ and } x_3 \geq 0 \end{aligned}$$

UNIT-II

3. a) Write the procedure for Northwest Corner cell method. 5M
b) Find the initial basic feasible solution of the following transportation problem using VAM. 15M

	Warehouses				Capacity
	W1	W2	W3	W4	
F1	10	30	50	10	7
Factory F2	70	30	40	60	9
F3	40	8	70	20	18
Requirement	5	8	7	14	

OR

P.T.O

4. Consider the following transshipment problem with two sources and three destinations. The unit cost of transportation between different possible nodes is given in the following table. Find the optimal shipping plan such that the total cost is minimized. 20M

Source		Destination					Supply
		S1	S2	D1	D2	D3	
	S1	0	3	12	4	12	800
	S2	5	0	3	6	10	700
	D1	8	10	0	4	20	-
	D2	20	12	5	0	15	-
	D3	8	10	30	8	0	-
		-	-	500	400	600	

UNIT-III

5. Solve the following assignment problem using Hungarian method? 20M

Crew		Project				
		A	B	C	D	E
1		20	30	25	15	35
2		25	10	40	12	28
3		15	18	22	32	24
4		29	8	34	10	40
5		35	23	17	26	45

OR

6. Find the optimum integer solution to the following Linear programming problem.

$$\text{Maximize } z = 8x_1 + 6x_2$$

$$\text{Subject to } 8x_1 + 4x_2 \leq 85$$

$$3x_1 + 6x_2 \leq 95$$

$$x_1, x_2 \geq 0 \text{ and integers}$$

UNIT-IV

7. An electronic item has three components in series. The details of costs and reliabilities for different number of standby units for each of the components of the system are given below. 20M

No. of standby units	Component 1		Component 2		Component 3	
	Cost (Rs.)	Reliability	Cost (Rs.)	Reliability	Cost (Rs.)	Reliability
1	1	0.70	3	0.85	2	0.85
2	2	0.85	4	0.95	3	0.92
3	3	0.95	6	0.98	5	0.97

The total capital budgeted for this purpose is Rs.8. Determine the optimal number of standby units for each of the components of the system such that the total reliability of the system is maximized.

OR

P.T.O

8. a) The details of a project are given below. Find the critical path and the corresponding project completion time. 16M

Activity	A	B	C	D	E	F	G	H	I	J	K
Immediate predecessor	-	-	-	A,B,C	A,B,C	D	D,E	D,E	F	G	H
Duration (weeks)	4	3	2	5	6	7	6	9	4	6	8

- b) Discuss the phases of Project Management. 4M

UNIT-V

9. a) Define (i) Maximin principle (ii) Saddle point 4M
 b) Players A and B play a game in which each player has three coins (20p, 25p and 50p). Each of them selects a coin without the knowledge of the other person. If the sum of the values of the coins is an even number, A wins B's coin. If that sum is odd number, B wins A's coin.
 a) Develop a payoff matrix with respect to player A. 16M
 b) Find the optimal strategies for the players.

OR

10. The following table represents the payoff matrix with respect to player A. Solve it optimally using LPP. 20M

		Player B		
		1	2	3
Player A	1	2	3	-4
	2	5	-2	6
	3	2	6	3

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OR

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i) Among threads ii) Among process
- b) What is a dispatcher? What are its functions?
- c) What are the benefits of the virtual machine concept? Explain.

UNIT-II

3. a) With the help of suitable example and diagram, explain the concept of “Segmentation with paging”
- b) Discuss the contiguous, linked and indexed methods of allocating disk space.
- c) Explain the following allocation algorithms.
i) First-Fit ii) Best-Fit iii) Worst-Fit

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4. a) What is a working set model?
- b) What is a page Fault? How does the operating system handle this situation? Explain.
- c) Explain about the following:
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UNIT-III

5. a) Explain about critical section problem?
- b) Briefly explain different mechanisms for recovery from deadlocks.
- c) What are monitors? How can a monitor solution be provided to the “dining-philosopher” problem? Briefly explain.

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- b) Explain how the domain structure can be used to provide protection.
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UNIT-IV

7. a) Write short notes on the following:
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8. a) Explain structure of the stream.
b) How is reliability improved via redundancy? Explain the various RAID levels and improvement in performance via parallelism.

UNIT-V

9. a) Discuss the input and output system in linux by using the overall structure of the device-driver.
b) What are the main layers and subsystems of windows XP? Explain the architecture with diagram.

OR

10. a) Explain the windows NT architecture.
b) Explain the services provided by the windows kernel.

LOYOLA ACADEMY DEGREE & PG COLLEGE, OLD ALWAL
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MCA II/I Supplementary Examination, Aug- 2014

Subject : Design Analysis Of Algorithm
Sub. Code : MCA 11303

Exam Time : 3 hrs
Max. Marks : 100

UNIT -I

- 1) a) Explain various Asymptotic notations .Give the asymptotic complexity for Addition of two matrices.
- b) Give the algorithm for fibonacci numbers and determine its time complexity by the step count method.

(OR)

- 2) a) What is Primality Testing? Explain about Miller Rabins' Primality testing algorithm.
- b) Give the algorithm and example to insert an element into heap.

UNIT -II

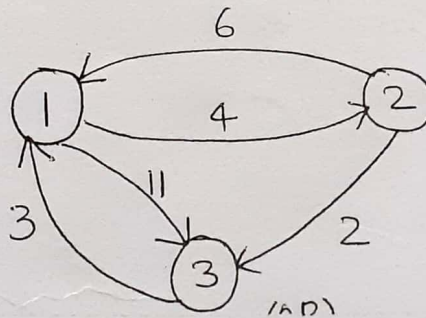
- 3) a) Explain Merge Sort algorithm with example .Obtain its time complexity.
- b) Explain the Strassen's matrix multiplication with example.

(OR)

- 4) a) Explain about Tree Vertex Splitting algorithm with example.
- b) Explain Kruskal's algorithm for finding minimum cost spanning tree with example.

UNIT -III

- 5) a) What is breadth first search? Explain the algorithm with example.
- b) Write an algorithm for All Pairs Shortest Path problem .Use it to solve the following



- 6) a) What is travelling Sales Person problem? Write an algorithm using dynamic programming.
- b) Explain the construction of optimal binary search tree.

(P.T.O)

UNIT -IV

- 7) a) Draw a portion of state space tree generated by least count branch & bound by the following Knapsack problem.

$$N=5; (P_1, P_2, P_3, P_4, P_5) = (10, 15, 6, 8, 4);$$

$$(W_1, W_2, W_3, W_4, W_5) = (4, 6, 3, 4, 2) \text{ and } m=12$$

- b) Write and Explain n-Queens algorithm.

(OR)

- 8) a) Explain graph coloring and give the algorithm to find all m-coloring of a graph.
b) Write a recursive back tracking algorithm to find all Hamiltonian cycle of a given graph.

UNIT -V

- 9) Explain the following problems:

(a) Node Cover Problem

(b) NP-Hard & NP-Complete

(OR)

- 10) a) Explain AND/OR graph decision problem with example.
b) Explain about flow shop scheduling.