

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

MCA I Year II Semester (R14) Regular End Semester Examinations Aug- 2015

DATABASE MANAGEMENT SYSTEM

Time: 3Hrs

Max Marks: 60

Note:

- 1) Attempt all the questions.
- 2) In Q.no 1 to 5 answer either I or II only.

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|-----------|---|-----|
| 1.(I) | What is ER Diagram? What are the uses of it? Explain in detail? | 12M |
| OR | | |
| 1.(II) | a) Give the detailed database system structure? | 6 M |
| | b) What are the advantages of DBMS? | 6 M |
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| 2.(I) | What is Relational Model? Explain its Advantages and Disadvantages? | 12M |
| OR | | |
| 2.(II) | Explain various Relational Algebra Operations with example? | 12M |
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| 3.(I) | Explain different types of Normal Forms with example | 12M |
| OR | | |
| 3.(II) | a) Explain Boyce – Codd Normal Form? | 8 M |
| | b) Explain Multi-Valued dependency? | 4 M |
| <hr/> | | |
| 4.(I) | Explain ACID properties of a Transaction? | 12M |
| OR | | |
| 4.(II) | Define Transaction? Explain about properties of Transaction? | 12M |
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| 5.(I) | Explain Exception Handling in PL/SQL? | 12M |
| OR | | |
| 5.(II) | a) Explain Data types in SQL with example? | 6M |
| | b) Explain Logical Operations in SQL? | 6 M |

*** END***

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DATASTRUCTURES THROUGH C++

Time: 3Hrs

Max Marks: 60

Note:

- 1) Attempt all the questions.
- 2) In Q.no 1 to 5 answer either I or II only.

- | | | |
|--------|---|-----|
| 1.(I) | a) Write in detail on function overloading with an example. | 6M |
| | b) Write in detail on exception handling in C++ with an example. | 6M |
| | OR | |
| 1.(II) | Write in detail on ++ as a pre increment and post increment operator overloading. | 12M |
| 2.(I) | a) Write a C++ function to return the sum of all numbers in an array. | 6M |
| | b) Write a C++ function to return an array of numbers that are common to two arrays of numbers that are passed as arguments.. | 6M |
| | OR | |
| 2.(II) | Write a C++ program to implement an ADT for complex number data type. | 12M |
| 3.(I) | Write a C++ program to convert an infix expression into a postfix expression using a C++ stack class. | 12M |
| | OR | |
| 3.(II) | Write a C++ program to evaluate a postfix expression using a C++ stack class. | 12M |
| 4.(I) | a) Write in detail on collision resolution techniques in Hash table implementation. | 6M |
| | b) Write in detail on skip lists and their applications. | 6M |
| | OR | |
| 4.(II) | Write a C++ class to implement a circular linked list with all operations. | 12M |
| 5.(I) | Write and explain a C++ program to implement heap sort method. | 12M |
| | OR | |
| 5.(II) | Write a C++ program to create a binary search tree and traverse it in inorder. | 12M |

*** END***

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DISCRETE MATHEMATICS

Time: 3Hrs

Max Marks: 60

Note:

- 1) Attempt all the questions.
- 2) In Q.no 1 to 5 answer either I or II only.

- 1.(I) a) Are $(p \rightarrow q) \rightarrow r$ and $p \rightarrow (q \rightarrow r)$ logically equivalent? 6M
Justify your answer by using rules of logic to simplify both expressions and also by using truth tables?
- b) Prove that $(P \wedge Q) \wedge R \Leftrightarrow P \wedge (Q \wedge R)$ by the Associative law? 6M

OR

- 1.(II) a) If $U = \{x / x < 12, x \in N\}$, $A = \{x / x = 1, 2, 3, 4\}$, 6M
 $B = \{x / x < 11, \text{ and } x \text{ is even natural number}\}$ and
 $C = \{x / x \in N, 2 < x < 7\}$ find i) A^c ii) B^c and iii) $(B - C)^c$
- b) Prove the theorem "The integer n is odd if and only if n^2 is odd". 6M

- 2.(I) a) Add $a = (1110)_2$ and $b = (1011)_2$ 6M
b) Find the greatest common divisor of 414 and 662 using the Euclidean algorithm. 6M

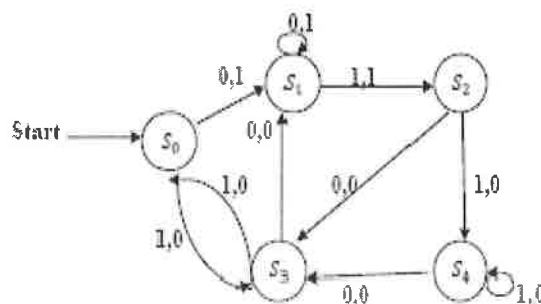
OR

- 2.(II) Prove that if $n \geq 1$, then $1(1!) + 2(2!) + \dots + n(n!) = (n+1)! - 1$ 12M

- 3.(I) a) Prove that the number of r -permutations of a set with 'n' distinct elements is $P(n, r) = n(n-1)(n-2) \dots (n-r+1)$ 8M
b) How many ways are there to select a first - prize winner, a second - prize winner, and a third - prize winner from 100 different people who have entered a contest? 4M

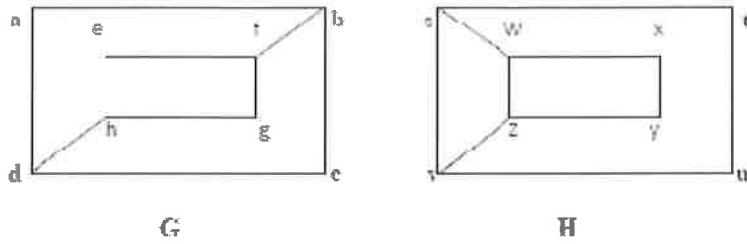
OR

- 3.(II) a) If $A = \{1, 2, 3\}$ and R on A , then give example of relation which is symmetric but neither reflexive nor anti-symmetric non transitive. 6M
b) Construct the state table for the finite - state machine with the following diagram. 6M



4.(I) Explain isomorphism of graph. Determine whether the following graphs are isomorphic or not?

12M



OR

4.(II) a) Explain Hamilton path, cycle and graph.
b) Show that K_n has a Hamilton circuit whenever $n \geq 3$.

6M

6M

5.(I) Solve the recurrence relation
 $a_n + 3a_{n-1} - 10a_{n-2} = 0 ; n \geq 2$ given $a_0 = 1, a_1 = 4$ using generating function.

12M

OR

5.(II) Solve $a_n - 10a_{n-1} + 25a_{n-2} = 2^n$

12M

*** END***

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OPERATING SYSTEM

Time: 3Hrs

Max Marks: 60

Note:

- 1) Attempt all the questions.
- 2) In Q.no 1 to 5 answer either I or II only.

- 1.(I) a. Define Operations of Operating System. Explain Evolution of Operating System 6 M
b. Define Operating System. Explain its Structure 6 M

OR

- 1.(II) a. What is system call? Explain types of system calls provided by an operating system 6 M
b. Explain the following
i. Operating system services 3M
ii. Operating system objectives and functions 3M

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- 2.(I) a. Explain the following in UNIX
i. Grep command 3M
ii. Vi Editor 3M
b. Explain the following in UNIX
i. Input redirection 3M
ii. Output redirection 3M

OR

- 2.(II) Explain the process utilities in Unix environment 12M

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- 3.(I) Explain the shell responsibilities and pipes in BASH 12M

OR

- 3.(II) Explain the shell filters and shell meta characters in BASH. 12M

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- 4.(I) Explain the different types of scheduling algorithms 12M

OR

- 4.(II) Describe the two methods for recovering from deadlocks 6 M
Describe shortest job first scheduling algorithm 6 M

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- 5.(I) Discuss how FIFOpage replacement algorithms can be implemented on the following reference string when numbers of frames is 4. Also calculate the number of page faults
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 12M

OR

- 5.(II) Explain the structure of paging and structure of page table 12M

*** END***

