

Hall Ticket Number :

R-15

Code: 5G441

II B.Tech. II Semester Supplementary Examinations May 2017

Database Management Systems

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Identify the main components in a DBMS and explain what they do. 7M
b) What are the advantages of DBMS? Explain. 7M

OR

2. a) What are five main functions of a database management administrator? 7M
b) Explain various storage manager components and its functions. 7M

UNIT-II

3. Draw ER diagram for the company database incorporating all the ER notations with explanation. 14M

OR

4. a) What are the steps in designing a database? 7M
b) With examples, explain enforcing integrity constraint. 7M

UNIT-III

5. a) Consider the following tables:
Employee (Emp_no, Name, Emp_city)
Company (Emp_no, Company_name, Salary)
i. Write a SQL query to display Employee name and company name. 7M
ii. Write a SQL query to display employee name, employee city ,company name and salary of all the employees whose salary >10000
iii. Write a query to display all the employees working in 'XYZ' company.
b) Briefly discuss about aggregate functions. Explain any three aggregate functions. 7M

OR

6. a) Briefly discuss about virtual table. 7M
b) With an example explain trigger and its needs. 7M

UNIT-IV

7. a) Compare 3NF and BCNF with a suitable example. 7M
b) What is dependency preserving for decomposition? Explain why it is important. 7M

OR

8. a) Suppose you are given a relation $R = (A,B,C,D,E)$ with the following functional dependencies: $\{CE \rightarrow D, D \rightarrow B, C \rightarrow A\}$.
i. Find all candidate keys.
ii. Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF). 7M
iii. If the relation is not in BCNF, decompose it until it becomes BCNF. At each step, identify a new relation, decompose and re-compute the keys and the normal forms they satisfy.
b) Explain 1st normal form(1 NF) with example. 7M

UNIT-V

9. a) Explain the distinctions between the terms Serial schedule and Serializable schedule. 7M
b) Why does a DBMS interleave current transactions? 7M

OR

10. a) Briefly discuss the AICD properties of transaction. 7M
b) What are the main difference between ISAM and B+ tree indexes? 7M

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R-15

Code: 5G143

II B.Tech. II Semester Supplementary Examinations May 2019

Formal Languages and Automata Theory

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Design a DFA that accepts the language $L(M)=\{W/W \in \{a, b\}^*\}$ and W does not contain 3 consecutive b's. 7M
- b) Construct a Moore machine to determine the residue mod 3 for each binary string treated as a binary integer. 7M

OR

2. a) Develop deterministic finite automata accepting the language given over the alphabet $\{0, 1\}$. $L = \{\text{the set of all strings such that every block of five consecutive contains at least two 0's}\}$. 7M
- b) Discuss about minimization of FSM and equivalence between two FSMs. 7M

UNIT-II

3. a) Construct NFA with moves for the regular expression $(0+1)^*$. 7M
- b) Prove or disprove that the language L given by $L = \{ a^m b^n / m, n, m \text{ and } n \text{ are positive integer} \}$ is regular. 7M

OR

4. a) Construct FA for regular expression $0^*1 + 10$. 7M
- b) Discuss about closure properties of regular sets. 7M

UNIT-III

5. a) Construct a regular grammar for the regular expression $a^*b(a+b)^*$. 7M
- b) Convert the given CFG to CNF
 $S \rightarrow aAs / a$
 $A \rightarrow SbA / SS / ba$ 7M

OR

6. Convert the given CFG to GNF
 $S \rightarrow ABA$
 $A \rightarrow Aa /$ 14M

UNIT-IV

7. a) Design a PDA for accepting a language $L = \{ a^n b^n / n \geq 1 \}$ 7M
- b) Discuss the procedure for conversion of CFG to PDA 7M

OR

8. a) Design PDA for the following grammar
 $S \rightarrow 0A$
 $A \rightarrow 0AB / 1$
 $B \rightarrow 1$ 7M
- b) Construct PDA for the language $L = \{ a^n b^{2n} / n \geq 1 \}$ 7M

UNIT-V

9. a) Write short notes on decidability of problems in detail? 7M
- b) Construct Turing Machine for language consisting of strings having any number of 0's and only even number of 1's over the input set $\{0, 1\}$. 7M

OR

10. a) Discuss the procedure for constructing items in LR(0) grammar with illustration. 7M
- b) Analyze Universal Turing Machine and Linear Bounded Automata. 7M

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R-15

Code: 5G144

II B.Tech. II Semester Supplementary Examinations May 2019

Object Oriented Programming

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) List and describe Java Buzzwords.
- b) Explain Object Oriented Programming concepts.

OR

- 2. a) List and classify the operators used in java. Explain any two operator classifications.
- b) Define recursion. Write a java program to find the factorial of a given number using recursion.

UNIT-II

- 3. a) What is meant by method overriding? Illustrate with an example.
- b) How packages are imported? Explain with suitable example.

OR

- 4. a) What are the uses of final keyword in inheritance? Explain with suitable examples.
- b) How to find packages and CLASSPATH in package? Explain.

UNIT-III

- 5. a) Explain isAlive() and join() methods in threads.
- b) How to create own exception sub class? Explain with example.

OR

- 6. a) Explain suspending, resuming and stopping threads.
- b) Write the benefits of Exception handling.

UNIT-IV

- 7. a) List the collection interfaces. Describe List interface.
- b) Explain applet life cycle with suitable program.

OR

- 8. a) With suitable example explain StringTokenizer.
- b) Describe the window fundamentals.

UNIT-V

- 9. a) Define an Event. List and briefly describe the event listener interfaces.
- b) What are the limitations of AWT?

OR

- 10. a) Write a java program to implement mouse events.
- b) Describe URL connection

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II B.Tech. II Semester Supplementary Examinations May 2019

Computer Organization

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Explain various components of Computers? 4M
b) List various interconnection structures and explain its use in multiprocessors? 10M

OR

2. a) How to represent negative numbers In computer? 7M
b) Explain about 2's complement approach for representing the fixed point numbers? 7M

UNIT-II

3. a) What is an arithmetic micro operation? Explain with examples 7M
b) Write short notes on the following:
i) Register transfer language
ii) Reduced Instruction set computer 7M

OR

4. a) Explain in detail about different instruction types and instruction sequencing. 7M
b) Discuss about different types of addressing modes? 7M

UNIT-III

5. a) What is meant by microprogramming? Explain the micro programmed control? 7M
b) Explain about control memory in a micro programmed control organization 7M

OR

6. a) List the advantages and disadvantages of micro programmed control unit over hardware control unit 7M
b) What are micro-subroutines? Explain. 7M

UNIT-IV

7. Show the step by step multiplication process using Booth algorithm when the following binary numbers are multiplied (+15) * (-13). Assume 5-bit registers that hold signed numbers and draw the flow chart for the corresponding example 14M

OR

8. a) Draw the flow chart for division algorithm? 7M
b) Explain the different mapping techniques used in the usage of Cache memory. 7M

UNIT-V

9. a) Describe in detail about Input Output Organization. 7M
b) What is DMA? Describe how DMA is used to transfer data from peripherals. 7M

OR

10. a) Explain instruction pipelining. 7M
b) What is branch hazard? Describe the method for dealing with the branch hazard? 7M

Code: 5G142

II B.Tech. II Semester Supplementary Examinations May 2019

Design and Analysis of Algorithms

(Common to CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Explain in brief about Asymptotic notations with examples. 7M
b) Explain the Performance Analysis of the algorithm. 7M

OR

2. a) Define Time and Space Complexity, and calculate the time space complexity for addition of two matrices. 7M
b) Explain how Time Complexity is calculated. Give an example. 7M

UNIT-II

3. a) Explain the general method of Divide and Conquer. 7M
b) Give the Quick Sort algorithm and analyze the efficiency. 7M

OR

4. a) Explain the merge sort algorithm with an example and also draw the tree structure of the recursive calls made. 7M
b) What is the solution generated by the function Job Sequence when $n=5$
(p_1, p_2, p_3, p_4, p_5)=(20,15,10,5,1), (d_1, d_2, d_3, d_4, d_5)=(2,2,1,3,3)? 7M

UNIT-III

5. a) Explain about Reliability Design. 7M
b) Find the optimal solution for the Knapsack instance
 $n=7, M=15$ ($p_1, p_2, p_3, p_4, p_5, p_6, p_7$)=(10,5,15,7,6,18,3) and
($w_1, w_2, w_3, w_4, w_5, w_6, w_7$)=(2,3,5,7,1,4,1) by using dynamic programming. 7M

OR

6. a) Solve the following instance of OBST problem
Identifier set = (a_1, a_2, a_3, a_4)
 $P = (1/20, 1/5, 1/10, 1/20)$ $Q = (1/5, 1/10, 1/5, 1/20, 1/20)$. 7M
b) Discuss all pairs shortest path problem with an example. 7M

UNIT-IV

7. a) Write an algorithm for 8 Queen's problem using backtracking and explain with an example. 7M
b) Draw the portion of state space tree generated by sum of subsets problem for a set of integers $N = (12, 1, 50, 3, 20, 8)$ whose sum is exactly equivalent to 44 by backtracking algorithm. 7M

OR

8. a) Consider the TSP instance by the cost matrix
- | | | | |
|----|----|---|---|
| 11 | 10 | 9 | 6 |
| 8 | 7 | 3 | 4 |
| 8 | 4 | 4 | 8 |
| 11 | 10 | 5 | 5 |
| 6 | 9 | 5 | 5 |
- Solve the problem by applying LCBB. 7M
b) Describe the Branch and Bound technique. How the Branch and Bound technique can be used to solve 0/1 Knapsack problem? 7M

UNIT-V

9. a) Explain the relationship between P and NP. 7M
b) Show the job sequencing with deadlines problem is NP-hard. 7M

OR

10. Explain Cook's theorem in detail 14M
