MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

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DEPARTMENT OF INFORMATION TECHNOLOGY

II B.TECH II SEMESTER PREVIOUS QUESTION PAPERS

LIST OF SUBJECTS

CODE	NAME OF THE SUBJECT
R15A0508	DESIGN AND ANALYSIS OF ALGORITHMS
R15A0509	DATABASE MANAGEMENT SYSTEMS
R15A0506	FORMAL LANGUAGE AND AUTOMATA THEORY
R15A0507	JAVA PROGRAMMING
R15A0061	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
R15A0511	SOFTWARE ENGINEERING

R15

Code No: **R15A0508**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Design and Analysis of Algorithms

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART – A (25 Marks)

1. (a) Define an Algorithm and list the characteristics. [2M]
   (b) What is time complexity of Stassen's matrix multiplication? [3M]
   (c) Write function for Union and find [2M]
   (d) Give the example for Bi-connected components [3M]
   (e) What is reliability design? [2M]
   (f) What is single source shortest path problem [3M]
   (g) What is Hamiltonian cycle [2M]
   (h) Define the Branch and bound. [3M]
   (i) What is **NP hard** and **NP complete** problems? [2M]
   (j) Give the purpose of lower bound. [3M]

PART – B (50 Marks)

SECTION – I

2. Discuss Quick sort with an example. List the different performance issues of it. [10M]

(OR)

3. A) What is Performance analysis of an algorithm? [4M]
   B) What is Amortized analysis? Explain. [6M]

SECTION – II

4. How do you construct a minimum Spanning tree using prims algorthim explain? List any two applications. [10M]

(OR)

5. Write the efficient non-recursive Binary tree traversals algorithm and give its time complexity. [10M]

SECTION – III

6. Write and explain the optimal binary search tree algorithm. [10M]

(OR)

7. Find all the solutions to the Travelling salesman problem by using dynamic programming. [10M]

$$\begin{pmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{pmatrix}$$

SECTION – IV

8. What is LC search? Discuss LC- search algorithm. [10M]

(OR)

9. What is Subset-sum problem? How do you solve this by using backtracking. [10M]

SECTION – V

10. Write the Cooks theorem. Explain the significance of it. [10M]

(OR)

11. Discuss all the NP-hard graph problems. [10M]

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R15

Code No: **R15A0509**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Database Management Systems

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks

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PART – A (25 Marks)

1. (a) Define Entity , attribute & relationship with examples. [2M]
   (b) Who is a DBA? What are the responsibilities of a DBA? [3M]
   (c) Write short notes on Schema diagram. [2M]
   (d) What is the difference between tuple relational calculus and domain relational calculus? [3M]
   (e) What meant by trivial dependency? [2M]
   (f) What is meant by normalization of data? [3M]
   (g) Write a note on Thomas write rule? [2M]
   (h) Write a short note on remote backup systems? [3M]
   (i) Define sparse index? [2M]
   (j) What are the advantages and disadvantages of indexed sequential file? [3M]

PART – B (50 Marks)

SECTION – I

2. Explain about the Purpose of Database system &advantages of DBMS. [10M]

(OR)

3. Discuss the basic concepts of E-R Model. [10M]

SECTION – II

4. Explain about data integrity constraints. [10M]

(OR)

5. Explain about various types of JOIN operations in SQL. [10M]

SECTION – III

6. Briefly explain about 1NF, 2NF and 3NF. [10M]

(OR)

7. Write about decomposition preservation algorithm for all FD's. [10M]

SECTION – IV

8. What is Serializability? Explain its Types. [10M]

(OR)

9. Explain about ACID properties . [10M]

SECTION – V

10. Briefly explain about Organization of records in files. [10M]

(OR)

11. Explain about Static hash function. What is the need for Dynamic Hash function? [10M]

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R15

Code No: **R15A0506**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Formal Language and Automata Theory

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART – A (25 Marks)

1. (a) Define Deterministic Finite Automata. (2M)
   (b) Define the language accepted by NFA with ε transition. (3M)
   (c) List out the applications of Regular Expressions. (2M)
   (d) Explain Pumping lemma for regular sets. (3M)
   (e) Define Chomsky Normal Form. (2M)
   (f) Define a left linear grammar with an example. (3M)
   (g) Define the model of PDA. (2M)
   (h) Differentiate deterministic PDA and non-deterministic PDA. (3M)
   (i) What is universal Turing machine? (2M)
   (j) Explain church hypothesis problem. (3M)

PART –B (50 Marks)

SECTION – I

2. a) Differentiate between DFA and NFA. (5M)
   b) Design DFA over $\Sigma = \{a, b, c\}$ for
   i) $(abc)^n$ with $n \geq 0$. (5M)

(OR)

3. a) Construct a DFA to accept modulo 7. (5M)
   b) Construct DFA equivalent to the following NFA (5M)

Σ / Q	0	1
→q_0	$\{q_0, q_1\}$	$\{q_1, q_1\}$
q_1	$\{q_1, q_2\}$	Ø
q_2	$\{q_1, q_2\}$	$\{q_2\}$

SECTION – II

4. a) Show that $\{a^n b^{2n} | n>0\}$ is not a regular set, using pumping lemma.(5M)
   b) Construct FA for regular expression $0^*1 + 10^*$ (5M)

(OR)

5. a) Write regular expressions for each of the following languages over an alphabet {0, 1}
   i) The set of all strings not containing "111"

ii) The set of all strings in which every pair of adjacent 0's appears before any pair of adjacent 1's (5M)

b) Explain the procedure to convert a Finite Automata to Regular Expression with an example. (5M)

SECTION – III

6. a) Construct right-linear and left-linear grammars for the following regular expression. $(0 + 1)^* 101(1 + 0)^*$ (5M)

   b) Convert the following grammar to Chomsky Normal Form (CNF) (5M)

   $E \rightarrow E+T \mid T$

   $T \rightarrow a \mid (E)$

(OR)

7. a) What is meant by ambiguous grammar? Test whether the grammar is ambiguous or not. (5M)

   $S \rightarrow A \mid B$

   $A \rightarrow aAb \mid ab$

   $B \rightarrow abB \mid \epsilon$

   B)Given CFG G = ({S, A}, {a, b}, P, S) where P consists of (5M)

   $S \rightarrow aAS \mid a$

   $A \rightarrow SbA \mid SS \mid ba$

   Give the LMD, RMD and parse tree for "aabbaa"

SECTION – IV

8. a) Design a PDA to accept equal no of a's and b's over the alphabet $(a+b)^*$. (5M)

   b) State and prove the equivalence of PDA and CFL. (5M)

(OR)

9. a) Obtain PDA to accept all strings generated by the language $\{a^n b^m a^n \mid m, n \geq 1\}$ (5M)

   b) Find a PDA that accepts $\{ww^R / w \text{ in } (a+b)^*\}$ by final state. (5M)

SECTION – V

10. a) Construct LR(0) items for the grammar given, find its equivalent DFA. Check the parsing by taking a suitable derived string.

    $E \rightarrow T\ E^l$

    $E^l \rightarrow +\ T\ E^l \mid \varepsilon$

    $T \rightarrow F\ T^l$

    $T^l \rightarrow *\ F\ T^l \mid \varepsilon$

    $F \rightarrow (E) / id$(6M)

    b) Design a Turing Machine to accept the strings having equal number of 0's and 1's. (4M)

(OR)

11. a) Show that the PCP with two lists x = (b, bab^3, ba) and y = (b^3, ba, a) has a solution. Give the solution sequence. (6M)

    b) Explain about NP complete and NP hard problem. (4M)

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R15

Code No: **R15A0507**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Java Programming

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART – A **(25 Marks)**

1.

a) What are the main features of OOPS? [2M]
b) Explain method overloading. [3M]
c) What is the difference between final, finally and finalize keywords in JAVA? [2M]
d) What is an event? What is the event delegation model? [3M]
e) Explain the usage of this key word. [2M]
f) Draw the architecture of the life cycle of an Applet. [3M]
g) Distinguish between multiple and multilevel inheritance. [2M]
h) What is Layout managers? [3M]
i) Write the four types of JDBC drivers with syntax. [2M]
j) How exception handling is managed by five keywords. [3M]

PART – B **(50 Marks)**

SECTION – I

2. A) What are the benefits of Object Oriented Programming? [5M]
B) Write a Recursive JAVA program to find the factorial of a given Number. [5M]

(OR)

3. A) Explain with the help of a program how object oriented programming overcomes the shortcomings of procedure oriented programming.[5M]
B) Explain the use of "super" keyword with an example program. [5M]

SECTION – II

4. Explain the concepts of encapsulation, inheritance, dynamic binding and message communication using an example(s). [10M]

(OR)

5. Discuss the various levels of access protection available for packages and their implications. What is static import? [10M]

SECTION – III

6. Explain Multithreading. In how many ways java implements multithreading? Explain at least one of these ways with appropriate example. [10M]

(OR)

7. What is an exception? What are different exceptions in Java? Explain how you can handle exception in JAVA with the help of an example using try-catch-finally block. [10M]

SECTION – IV

8. Explain FileInputStream and FileOutputStream with example programming. [10M]

(OR)

9. Create an inheritance hierarchy of Rodent: Mouse, Gerbil, Hamster, etc. In the base class, provide methods that are common to all Rodents, and override these in the derived classes to perform different behaviors depending on the specific type of Rodent. Create an array of Rodent, fill it with different specific types of Rodents, and call your base-class methods. Explain the output. [10M]

SECTION – V

10. Discuss class hierarchy of javax.Swing package. List Three Controls of this package along with their use. [10M]

(OR)

11. A) Explain different types of layout managers. [6M]
    B) Write a program for handling mouse events[4M] .

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Code No: R15A0061

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Managerial Economics and Financial Analysis

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART – A (25 Marks)

1. (a) State and explain the law of demand. [2M]
   (b) Explain trend projection method of demand forecasting. [3M]
   (c)Explain the law of variable proportions. [2M]
   (d) Discuss the various determinants of cost. [3M]
   (e) Define break even analysis. [2M]
   (f) What is meant by perfect competition? [3M]
   (g) What is meant by balance sheet? [2M]
   (h) Explain the accounting cycle in brief. [3M]
   (i) Explain Pay back period method. [2M]
   (j) Write a note on Accounting Rate of Return. [3M]

PART –B (50 Marks)

SECTION – I

2. (a) Define demand forecasting with an example. [3M]
   (b) Explain the various factors for demand forecasting for a new product. [7M]

(OR)

3. Define managerial economics and explain its main characteristics and functions. [10M]

SECTION – II

4. Explain cost output relationship with reference to total fixed costs and output, total variable cost and output.[10M]

(OR)

5. (a) Illustrate Cobb-Douglas production function. [5M]
   (b) Discuss economies of scale. [5M]

SECTION – III

6. What is price discrimination? Explain essential conditions for price discrimination. [10M]

(OR)

7. Discuss the features of partnership form of business. Explain its advantages and disadvantages. [10M].

SECTION – IV

8. Explain the golden rules of accounting? Draw the Pro forma of trading, profit and loss and balance sheet. [10M]

(OR)

9. Define accounting? Explain various concepts and conventions [10M]

SECTION – V

10. Explain with examples how you would use ratio analysis to understand financial statements.[10M]

(OR)

11. From the following information, calculate NPV and decide the project criteria [10M]

Year	Project X	Project Y
1	10000	12000
2	15000	10000
3	8000	9000
4	5000	10000

Cost of the project is Rs.50,000/- discount factor 12%

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R15

Code No: **R15A0511**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester supplementary Examinations, Nov/Dec 2018

Software Engineering

(IT)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART – A **(25 Marks)**

1. (a) Define Software Engineering [2M]
   (b) Explain about the layered technology [3M]
   (c)What is difference between Functional and non-functional requirements? [2M]
   (d) Illustrate the Requirements validation [3M]
   (e) Explain about the Design process and Design quality [2M]
   (f) List Out the interface design steps [3M]
   (g) Differentiate between the Black-Box and White-Box testing [2M]
   (h) Explain about the Risk identification [3M]
   (i) Discuss about the Software quality assurance [2M]
   (j) Explain about the Software reliability [3M]

PART –B **(50 Marks)**

SECTION – I

2. Discuss about the waterfall model with neat diagram. [10M]

(OR)

3. Discuss about the Capability Maturity Model. [10M]

SECTION – II

4. Write short notes on User requirements and System requirements [10M]

(OR)

5. Explain about the software requirements document [10M]

SECTION – III

6. Explain about the Architectural styles and patterns [10M]

(OR)

7. Explain about the An Object-Oriented design process[10M]

SECTION – IV

8. Discuss about the A strategic approach to software testing [10M]

(OR)

9. Write short notes on Validation testing and System testing [10M]

SECTION – V

10. Explain about the Quality concepts [10M]

(OR)

11. Discuss about the Software Reviews [10M]

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