QUESTION BANK

B.TECH II YEAR – II SEM (R17)
(2018-19)

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Recognized under 2(f) and 12 (B) of UGC ACT 1956

(Affiliated to JNTUH, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)

Maisammaguda, Dhulapally (Post Via. Hakimpet), Secunderabad – 500100, Telangana State, India

R17

Code No: xxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

DESIGN AND ANALYSIS OF ALGORITHMS

II B. Tech II Semester Model Paper-I

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. a) Define time and space complexity. Explain with examples. [14M]

(OR)

2. Write non recursive binary tree traversal algorithms [14M]

SECTION – II

3. Explain General method of Greedy method. Find the greedy solution for following job sequencing with deadlines problem n = 7, (p1,p2,p3,p4,p5,p6,p7) = (3,5,20,18,1,6,30), (d1,d2,d3,d4,…,d7)=(1,3,4,3,2,1,2) [14M]

(OR)

4. Illustrate Merge sort algorithm and discuss its time complexity

SECTION – III

5 .solve a travelling sales person problem using dynamic programming [14M]

.

(OR)

6 .Deign a three stage reliable system for the following instance of the problem (c1,c2,c3)=(30,15,20), (r1,r2,r3)=(0.9,0.8,0.5) and C=105. [14M]

SECTION – IV

7. How n-Queen's problem can be solved using back tracking and explain with an example. [14M]

(OR)

8 a) Explain AND/OR graphs.[7M]

b) Explain game trees [7M]

SECTION – V

9. Discuss Draw the portion of state space tree generated by FIFOBB for the following instance of 0/1 knapsack n= 5, M=12, (p1, ……p5) = (10,15,6,8,4) (w1,.....w5)=(4,6,3,4,2)[14M]

(OR)

10. (a) Write and explain the Cooks theorem. [7M]

    (b) What is non deterministic algorithm explain. [7M]

****

R17

Code No: xxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-II

Design and analysis of Algorithms

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

.

SECTION – I

1. a) Explain in detail about asymptotic notations. [7M]
   b) Explain step count method for finding time complexity with an example [7M]

(OR)

2. Discuss union and find algorithms in detail with an example. [14M]

SECTION – II

3. Explain Strassen's matrix multiplication and its time complexity[14M]

(OR)

4. a) Explain Prim's algorithm for minimal spanning tree with an example.[7M]
   b) Discuss binary search algorithm and analyze its time complexity[7M]

SECTION – III

5. Explain matrix chain multiplication problem and Find the minimum no of operating required for the following chain matrix multiplication using dynamic programming.
   A(20,30)*B(30,10)*C(10,5)*D(5,15).[14M]

(OR)

6. Give solution for multistage graph using dynamic programming. [14M]

SECTION – IV

7. Explain the following graph traversal
   (a) Depth First search [7M]
   (b) Breath First search. [7M]

(OR)

8. Give the solution to the m-coloring of a graph using backtracking. [14M]

SECTION – V

9. Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class. [14M]

(OR)

10. Describe Travelling Salesperson Problem (TSP) using Branch and Bound.[14M]

****

R17

Code No: R15A0508

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-III

Design and analysis of Algorithms

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

.

SECTION – I

1. Explain the following with an example
   a) Probabilistic analysis [7M]
   b) Amortized analysis.[7M]

(OR)

2. a) Explain about Disjoint set operations.[7M]
   b) Write short notes on spanning trees. [7M].

SECTION – II

3. Define Greedy knapsack. Find the optimal solution of the Knapsack instance n= 7, M=15, (p1, p2, ……p7) = (10,5,15,7,6,18,3) and (w1,w2,.....w7)=(2,3,5,7,1,4,1). [14M]

(OR)

4. Illustrate Quick sort algorithm and discuss its time complexity [14M]

SECTION – III

5 .Let n=4 and (a1,a2,a3,a4) Construct optimal binary search for (a1, a2, a3, a4) = (do, if, int, while), p(1 : 4) = (3,3,1,1) q(0 : 4)= (2,3,1,1,1) [14M]

(OR)

6. Explain how solution will be provided for all pairs shortest path problem using dynamic programming.[14M]

SECTION – IV

7. Explain about bi-connected components in detail. [14M]

(OR)

8. Give the solution to the sum of subsets problem using backtracking. [14M]

SECTION – V

5. a) Explain non-deterministic algorithm with an example. [7M]

   b) Explain Satisfiability problem.[7M]

(OR)

10. Draw the portion of state space tree generated by LCBB for the following instance of 0/1 knapsack n= 5, M=12, (p1, ……p5) = (10,15,6,8,4) (w1,.....w5)=(4,6,3,4,2)

****

R17

Code No: **R15A0508**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-IV

Design and analysis of Algorithms

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

.

SECTION – I

1. a) Explain the process of designing an algorithm. Give characteristics of an algorithm.
   b) Explain asymptotic notations.

(OR)

2. a) Explain non- recursive Post order tree traversal .[7M]
   b) Explain krushkal's algorithm for MST. [7M].

SECTION – II

3. Define Greedy knapsack. Find the optimal solution of the Knapsack instance n= 7, M=20, (p1, p2, ……p7) = (8,5,6,7,6,12,3) and (w1,w2,.....w7)=(2,10,8,7,6,4,11). [14M]

(OR)

4. Simulate Quick sort algorithm for the following example 25,36,12,4,5,16,58,54,24,16,9,65,78 [14M]

SECTION – III

5 .Let n=4 and (a1,a2,a3,a4) Construct optimal binary search for (a1, a2, a3, a4) = (cout, float, if, while), p(1 : 4) = (1/20,1/5,1/10,1/20) q(0 : 4)= (1/5,1/10,1/5,1/20,1/20) [14M]

(OR)

6. Give the optimal solution for 0/1 knapsack problem using dynamic programming (p1,p2,p3, p4) = (11, 21, 31, 33), (w1, w2, w3, w4) = (2, 11, 22, 15), M=40, n=4. [14M]

SECTION – IV

7. What is an articulation point? How to find articulation point for a given graph. [14M]

(OR)

8. Give the solution to Hamiltonian cycle problem using backtracking. [14M]

SECTION – V

9. What is state space tree? What are the different ways of searching an answer node in an state space tree explain with example. [14M]

(OR)

10. a) write non-deterministic algorithm for knapsack problem?[7M]
    b) different between NP-hard and NP-complete problems

****

R15

Code No: **R15A0508**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, April/May 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.

PART – A (25 Marks)

5. (a) General strategy of divide and conquer [2M]
   (b) What are the performance analysis techniques of an algorithm? [3M]
   (c) What is union and find? [2M]
   (d) Explain bi connected components. [3M]
   (e) What is job sequencing with deadlines? [2M]
   (f) What is greedy method? [3M]
   (g) What is a graph coloring problem? [2M]
   (h) What is general backtracking method? [3M]
   (i) What is the difference between NP hard and NP Complete problem? [2M]
   (j) List the advantages of dynamic programming. [3M]

PART – B (50 Marks)

SECTION – I

6. Explain in detail about asymptotic notations. [10M]

(OR)

7. Explain Merge sort technique. Give the time complexity of merge sort. [10M]

SECTION – II

8. Explain the following graph traversal
   (c) Depth First search [5M]
   (d) Breath First search. [5M]

(OR)

5. Write short notes on
   a) Game trees [5M]
   b) AND/OR graphs [5M]

SECTION – III

6. How do you construct a minimum Spanning tree using kruskals algorithm explain? List any two applications. [10M]

(OR)

7. State dynamic programming. Explain with one application. [10M]

SECTION – IV

8. Explain the Travelling salesmen problem using Branch and bound technique. [10M[

(OR)

9. Give the solution to the 8 queen's problems using backtracking. [10M]

SECTION – V

10. Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class. [10M]

(OR)

11. (a) Write and explain the Cooks theorem. [5M]

(b) What is non deterministic algorithm explain. [5M]

****

R17

Code No: R17A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Supplementary Examinations

DATABASE MANAGEMENT SYSTEMS

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. What is logical data independence and why is it important?

OR

2. a) What is partial key? How is it represented in ER diagram? Give an example?
b) What is a descriptive attribute? Explain?
c) Discuss the usage of ISA feature in ER diagram?

SECTION – II

3. Explain the following with examples.
a) Key constraints. b) Foreign key constraints.

OR

4. What is a view? Explain about views in detail?

SECTION – III

5. Explain the following
a) Lossless Join b) Lossless decomposition

OR

6. What are the advantages of normalized relations over the unnormalized relations?

SECTION – IV

7. a) How the use of 2PL would prevent interference between the two transactions.
b) Explain the difference between strict 2PL and rigorous 2PL?

OR

8. Explain different recovery techniques used in transaction failure?

SECTION – V

9. Explain all the operations on B+ tree by taking a sample example

OR

10. Explain B+ Trees with examples?

****

R17

Code No: R17A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Supplementary Examinations

DATABASE MANAGEMENT SYSTEMS

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. a) Describe storage manager component of database system structure?
b) Explain levels of abstraction in DBMS

OR

2. Explain the E-R diagram components and notations with their extended features?

SECTION – II

3. Explain the following.
a) Types of Join Operations b) Set Operations

OR

4. a) Define Relational Algebra, tuple and domain relational calculus?
b) What are the differences between the two types of relational calculus?

SECTION – III

5. Define BCNF? How does BCNF differ from 3NF? Explain with an example.

OR

6. What is Redundancy? What are the different problems encountered by redundancy? Explain them.

SECTION – IV

7. What are the transaction isolation levels in SQL?

OR

8. Explain how concurrency execution of transactions improves overall system performance?

SECTION – V

9. a) What is the relationship between files and Indexes?
b) What is the search key for an Index?
c) What is Data entry in an Index

OR

10. Explain shadow-copy Technique for Atomicity and Durability.

****

R17

Code No: R17A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Supplementary Examinations

DATABASE MANAGEMENT SYSTEMS

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. Define DBMS? List Database system applications.

OR

2. List four significant differences between a file processing system and a DBMS?

SECTION – II

3. a) Write a detail note on participation constraints?
b) What is the class hierarchy? How is it represented in the ER diagrams?

OR

4. What are NULL values? Explain in detail.

SECTION – III

5. Explain FD and MVD with examples

OR

6. What is Normalization? Discuss what are the types? Discuss the 1NF, 2NF, 3NF with example?

SECTION – IV

7. What are the types of failures of a system?

OR

8. What are the two tables used in crash recovery along with log record? Explain with suitable example?

SECTION – V

9. Explain about tertiary storage media in detail?

OR

10. Explain
a) Clustered Indexes b) Primary and Secondary Indexes

****

R17

Code No: R17A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Supplementary Examinations

DATABASE MANAGEMENT SYSTEMS

(CSE& IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: .Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. Explain key constraints with an example?

OR

2. Discuss the query processor of database system structure?

SECTION – II

3. Explain different types of Join Operations with relevant examples.

OR

4. Explain the following in SQL with examples.

a) Nested Queries b) Correlated Queries

c) Group by and Having Clauses d) Triggers

SECTION – III

5. Explain about the fourth and fifth normal forms.

OR

6. Define Functional dependencies? How are primary keys related to functional dependencies?

SECTION – IV

7. Write the locking compatibility matrix used for multiple granularity? Explain with suitable examples?

OR

8. Define the concept of schedule for a set of concurrent transaction. Give a suitable example.

SECTION – V

9. Explain about Tree based Indexing and Hash based Indexing.

OR

10. a) Explain about fixed length file organization with an example?

b) Explain about byte-string representation in detail.

****

R15

Code No: R15A0509

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, April/May 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.

****

PART – A (25 Marks)

1.(a) Differentiate between conceptual data independence and physical data independence.[2M]
(b) Specify two kinds of constraints with respect to 'ISA' hierarchies/relationship. [3M]
(c) What is the difference between UNIQUE key and Primary Key in relational Model? [2M]
(d) Discuss the notations in ER-Diagram[3M]
(e) What is foreign key? [2M]
(f) What is the difference between UNION and UNION ALL in SQL?[3M]
(g) Define the term ACID properties.[2M]
(h) What are two types of lock-based protocols?[3M]
(i) What is called a query –execution engine?[2M]
(j)Compare sequential access file versus random access files.[3M]

PART – B (50 Marks)

SECTION – I

2.(a) What are the Different types of Data Models? Explain about Relational Model? [5M]
(b)Why would you choose a database system instead of file system? [5M]

(OR)

3. What is DBMS? Explain architecture of DBMS with diagram. [10M]

SECTION – II

4(a). Consider the following tables: [4M]
Employee (Emp_no, Name, Emp_city)
Company (Emp_no, Company_name, Salary)

i. Write a SQL query to display employee name, employee city ,company name and salary of all the employees whose salary >10000
ii. Write a query to display all the employees working in 'XYZ' company.

(b) Explain various DML commands with neat syntax. [6M]

(OR)

5.(a) What is view in SQL? How is it defined? [5M]
(b) .What are aggregate functions? And list the aggregate functions supported by SQL? [5M]

SECTION – III

6.(a) Why normalization is required? And explain different types of normal forms[5M]

(b) Define BCNF .How does it differ from 3NF [5M]

(OR)

7(a) .What is meant by lossless-join decomposition? [5M]

(b). Explain 2NF and 3NF in detail. [5M]

.

SECTION – IV

8. (a) Explain Time stamp-Based Concurrency Control protocol [5M]
(b) Explain remote backup system [5M]

(OR)

9. (a) Explain about validation based protocols. [5M]
(b Discuss on strict, two-phase locking protocol [5M]

SECTION – V

10. Explain static and dynamic Hashing Techniques? [10M]

(OR)

11. Explain in detail insertion methods B+ tree index files with example.[10M]

******

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year II Semester Examinations

FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 hours **Max Marks: 70**

SECTION-I

1) Construct a Mealy machine which is equivalent to the Moore machine given in table. (14M)

Present State	Next State		Output
	a=0	a=1	
$\rightarrow q_0$	q_3	q_1	0
q_1	q_1	q_2	1
q_2	q_2	q_3	0
q_3	q_3	q_0	0

(OR)

2) Construct the corresponding Mealy machine to the Moore machine described by the transition table given. (14M)

Present State	Next State		Output
	a=0	a=1	
$\rightarrow q_1$	q_1	q_2	0
q_2	q_1	q_3	0
q_3	q_1	q_3	1

SECTION -II

3) a) Write the Regular Expression for the language L over {0, 1} such that every string must contain at least "000"

b) Define Regular Expression & Design a Regular expression set of all starting with "a" and ending with "b"

(OR)

4) Explain left & right derivations and left & right derivation trees with examples? (14M)

SECTION-III

5) State and prove pumping lemma for CFG? (14M)

(OR)

6) Explain CNF with example? (14M)

SECTION - IV

7) Design Turing Machine to increment the value of any binary number by one. The output should also be a binary number with value one more the number given. (14M)

(OR)

8) Explain LBA with example? (14M)

SECTION -V

9) a) Design Turing Machine over $\{0,1\}$, $L = \{w \mid |w| \text{ is a multiple of } 3\}$.

b) Draw the transition diagram for above language. (14M)

(OR)

10) a) Explain un decidability of posts with example (7M)

b) Explain universal Turing machine?(7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year II Semester Examinations

FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 hours **Max Marks: 70**

SECTION-I

1) a) Construct DFA and NFA accepting the set of all strings containing 10 as a substring.
b) Draw the transition diagram of a FA which accepts all strings of a's and b's in which both the number of b's and a's are even.
c) Define NFA with epsilon with an example. (14M)

(OR)

2) a) Construct a DFA with reduced states equivalent to the regular expression 10 + (0 + 11)0* (7M)
b) Prove (a + b)* = a*(ba*)* (7M)

SECTION -II

3) Prove pumping lemma of regular sets? (14M)

(OR)

4) a)Write Regular expression for Set of all the string over {a, b} containing exactly two a's

b)Define pumping lemma and Write Regular Expression which denoting the language containing empty string.

SECTION -III

5) Convert the following Push down Automata to Context Free Grammar (14M)

$M= (\{q0,q1\},\{a,b\}\{z0,za\},\delta,q0,z0,\varphi)$

δ is given by

$\delta\ (q0,a,z0)=(q0,za\ z0)$

$\delta\ (q0,a,za)\ =(q0,za\ za)$

$\delta\ (q0,b,za)\ =(q1,\varepsilon)$

$\delta\ (q1,b,za)\ =(q1,\varepsilon)$

$\delta\ (q1,\ \varepsilon,z0)\ =(q1,\varepsilon)$

(OR)

6) Convert the following grammar to Greibach Normal Form G = ({A1, A2, A3}, {a,b},P,S) Where P consists of the following

$A1 \rightarrow A2\ A3$

$A2 \rightarrow A3\ A1 \mid b$

$A3 \rightarrow A1\ A2 \mid a$ (14M)

SECTION -IV

7) Design Turing Machine to increment the value of any binary number by one. The output should also be a binary number with value one more the number given. (14M)

(OR)

8) Explain counter machine (14M)

SECTION -V

9) What are the various variations of TM? How to achieve complex tasks using TM (14M)

(OR)

10) a) Explain correspondence problem? (7M)
b) Explain P and NP problems?(7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year II Semester Examinations

FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 hours **Max Marks: 70**

SECTION - I

1) Design a Moore machine to determine the residue mod 5 for each binary string treated as integer.(14M)

(OR)

2) Draw the transition table, transition diagram, transition function of DFA

a) Which accepts strings which have odd number of a's and b's over the alphabet {a,b}

b) Which accepts string which have even number of a's and b's over the alphabet {a,b}

c) Which accepts all strings ending in 00 over alphabet {0, 1}

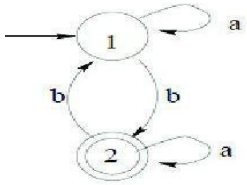
d) Which accepts all strings having 3 consecutive zeros?

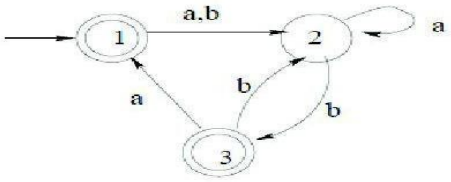
e) Which accepts all strings having 5 consecutive ones?

f) Which accepts all strings having even number of symbols?(14M)

SECTION - II

3) Convert the following finite automata to regular expressions:(14M)





(OR)

4) Find a Regular expression corresponding to each of the following subsets over {0,1}*.

a) The set of all strings containing no three consecutive 0's.

b) The set of all strings where the 10th symbol from right end is a 1.

c) The set of all strings over {0,1} having even number of 0's & odd number of 1's.

d) The set of all strings over {0,1} in which the number of occurrences of is divisible by 3 (14M)

SECTION -III

5) Convert the following grammar into CNF.

S->aAD

A->aB

B->bAB

D->d (14M)

(OR)

6) Prove that the following language is not context-free language L={www|w€{a,b}*} is not context free.(14M)

SECTION -IV

7) a) Describe the TM that accepts the language L = {w a{a,b,c}_ | w contains equal number of a's, b's, an c's}. (7M)

b) Explain in detail Church's hypothesis.(7M)

(OR)

8) a) Design a Turing Machine that accepts the set of all even palindromes over {0,1}.(7M)

b) Given _ = {0,1}, design a Turing machine that accepts the language denoted by the regular expressions 00* (7M)

SECTION -V

9) a) What is decidability? Explain any two undecidable problems.(7M)

b) Show that the following post correspondence problem has a solution and give the solution(7M).

	List A	List B
1	11	11
2	100	001
3	111	11

(OR)

10) a) Find whether the post correspondence problem P={(10,101),(011,11),(101,011)} has a match. Give the solution.

b) Explain Turing reducibility machines.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

B.Tech II Year II Semester Examinations

FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 hours **Max Marks: 70**

SECTION - I

1) a) Construct DFA and NFA accepting the set of all strings not containing 101 as a substring.
b) Draw the transition diagram of a FA which accepts all strings of 1's and 0's in which both the number of 0's and 1's are even.
c) Define NFA with an example. (14M)

(OR)

2) a) Draw the transition diagram of a FA which accepts all strings of 1's and 0's in which both the number of 0's and 1's are even.
b) Construct NFA which accepts the set of all strings over f0; 1g in which there are at least two occurrences of 1 between any two occurrences of 0. Construct DFA for the same set. (14M)

SECTION - II

3) Represent the following sets by regular expressions(14M)

(a) $\{0,1,2\}$

(b) $\{1^{2n+1} \mid n>0\}$

(c) $\{w \in \{a, b\}^* \mid w \text{ has only one a }\}$

(d) The set of all strings over $\{0,1\}$, which has at most two zeros

(OR)

4) Discuss about (14M)
a) Context Free Grammar
b) Left most derivation
c) Right most derivation
d) Derivation tree.

SECTION - III

5) Which of the following are CFL's? Explain (14M)

(a) $\{a^i b^j \mid i\neq j \text{ and } i\neq 2j\}$

(b) $\{a^i b^j \mid i\geq 1 \text{ and } j\geq 1\}$

(c) $\{(a+b)^* - \{a^n b^n \mid n\geq 1\}\}$

(d) $\{a^n b^n c^m \mid n\leq m\leq 2n\}$.

(OR)

6) a) Eliminate epsilon productions from the grammar `G' given as (7M)

$A \rightarrow aBb \mid bBa$
$B \rightarrow aB \mid bB \mid \varepsilon.$

b) Convert the following grammar to Greibach Normal Form (7M)

$S \rightarrow ABA - AB - BA - AA - B$
$A \rightarrow aA - a$
$B \rightarrow bB - b.$

SECTION - IV

7) Write a note on Turing Thesis. Define algorithm in terms of TM. (14M)

(OR)

8) Write short notes on: (14M)
a) Halting Problem of Turing Machine
b) Application of CFG
c) Multi Tape Turing Machine

d) Post-Correspondence Problem

SECTION - V

9) a) Find whether the post correspondence problem P={(10,101),(011,11),(101,011)} has a match. Give the solution.

b) Explain Turing reducibility machines.

(OR)

10) Write brief about the following (14M)

a) Decidability of problems

b) RICE Theorem

c) Undecidability of post correspondence problem.

R15

Code No: **R15A0506**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, April/May 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 NFA. (2M)
   (b) List out the applications of a Finite Automata. (3M)
   (c) Define Regular Expression with an example. (2M)
   (d) List out the closure properties of regular sets. (3M)
   (e) State Pumping lemma for CFL's. (2M)
   (f) Define a right linear grammar with an example. (3M)
   (g) What do you understand by the term LBA? (2M)
   (h) Show the acceptance of PDA by empty stack. (3M)
   (i) Define PCP and MPCP. (2M)
   (j) Define turning machine. How a TM accepts a language? (3M)

PART – B (50 Marks)

SECTION – I

2. a) Construct a DFA equivalent to the regular expression 10+(0+11)0*11+00 (5M)
   b) Explain Chomsky Hierarchy. (5M)

(OR)

3. a) Design a DFA for the following language, also give the transition diagram and the regular expression.

$L = \{ 0^m 1^n \mid m \geq 0 \text{ and } n \geq 1 \}$ (5M)

b) Find DFA equivalent to NFA, described by the following state transition table. I.S=p, F.S={q, s} (5M)

Q \ Σ	0	1
→ p	{q, s}	q
(q)	r	{q, r}
r	s	p
(**s**)	-	p

SECTION – II

4. Consider the following regular expression and construct the finite automaton
   a) $a + b$ b) $(a + b)^*$
   c) $a(a + b)^*$ d) $a(a + b)^*b$ e) $b+ba$ (10M)

(OR)

5. a) Convert the R.E. = $(a+b)^*$ into DFA (5M)
   b) Explain the steps to construct a FA for a given regular expression. (5M)

SECTION – III

6. a) Construct right-linear and left-linear grammars for the following regular expression.
   $A_0 \rightarrow aA1$, $A1 \rightarrow bA1$, $A1 \rightarrow a$, $A1 \rightarrow bA0$ (5M)
   b) Construct the left-most and right-most derivations and parse trees for the following grammar
   $S \rightarrow aB \mid bA$
   $A \rightarrow aS \mid bAA \mid a$
   $B \rightarrow bS \mid aBB \mid b$ which accepts the string "aaabbabbba". (5M)

(OR)

7. a) Construct a DFA for the following regular grammar
   $S \rightarrow Aa$
   $A \rightarrow Sb \mid Ab \mid \epsilon$ (5M)
   b) Convert the given grammar to GNF.
   $S \rightarrow AB$
   $A \rightarrow BS \mid b$
   $B \rightarrow SA \mid a$ (5M)

SECTION – IV

8. a) Obtain the PDA accept the language $L = \{w \mid w \in (a, b)^* \text{ and } n_a(w) > n_b(w)\}$ i.e., number of a's in 'w' is greater than number of b's in 'w'. (5M)
   b) Define Push Down Automata. Explain how CFG is accepted by PDA. (5M)

(OR)

9. a) Design a PDA which accepts strings of the language $\{0^n1^n \mid n \geq 1\}$ (5M)
   b) Convert the following grammar to PDA.
   $S \rightarrow aAD$
   $A \rightarrow aB \mid bAB$
   $B \rightarrow bBB \mid a$ (5M)

SECTION – V

10. a) Explain about different types of Turing machines. (5M)
b) Find whether the post correspondence problem P = {(10, 101), (011, 11), (101, 011)} has a match. Give the solution. (5M)

(OR)

11. a) Construct LR(0) items for the grammar given, find its equivalent DFA. Check the parsing by taking a suitable derived string.
   $S^1 \rightarrow S$
   $S \rightarrow AS \mid \varepsilon$
   $A \rightarrow aA \mid b$ (6M)
   b) Explain the Churches' hypothesis. (4M)

****

R17

Code No: xxxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

QUESTION PAPER

JAVA PROGRAMMING

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

1). Explain briefly about Object Oriented Programming concepts? [14M]

(OR)

2. a) Explain briefly about type conversion and type casting with example program? [7M]

b) Write a java program for finding the factorial of a given number using recursion? [7M]

SECTION-II

3. a)Explain different types of inheritances with example program? [7M]

b)What is a package? Explain User defined package with program? [7M]

(OR)

4. a)What is an Object class? Explain Object class methods? [7M]

b) Explain super keyword with program? [7M]

SECTION-III

5. a) What is an Exception? Explain different types of Exceptions? [7M]

b) Explain about try and catch with example program? [7M]

(OR)

6 a) Explain how to create a Thread with example program? [7M]

b) Explain about Thread Priority with example program? [7M]

SECTION- IV

7). Explain about Vector class and StringTokenizer class with example Program? [14M]

(OR)

9. a)Explain File class methods with program? [7M]

b) Explain different types of Drivers in JDBC? [7M]

SECTION- V

10.a) Write a java program for handling Mouse Events and Key Events? [7M]

b**)** Explain about AWT and Swing? [7M]

(OR)

11) Explain different types of Layouts with example program? [14M]

****

R17

Code No: xxxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

QUESTION PAPER

JAVA PROGRAMMING

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

1). Explain Procedure oriented programming and Object Oriented programming? [14M]

(OR)

2. a) Explain different loop control statements with example program? [7M]

b) Explain parameter passing Mechanism with example program? [7M]

SECTION-II

3. a)Explain Method overriding and Abstract class with example program? [7M]

b)What is inner class? Explain different types of inner classes? [7M]

(OR)

4. a)Difference between Interface and Abstract class? [7M]

b) Explain final keyword with method and class? [7M]

SECTION-III

5. a) What is user defined Exception? Explain user defined Exception with program? [7M]

b) Explain Multiple catch blocks with program? [7M]

(OR)

6 a) What is a Thread? Explain Thread Life cycle with neat diagram? [7M]

b) Explain Inter-Thread Communication with Producer and Consumer problem? [7M]

SECTION- IV

7). Explain Array List class, Vector class and Hash table class with example program? [14M]

(OR)

9. a)Explain FileInputStream and FileOutputStream class with example program? [7M]

b) Write a program to update data in the database using JDBC? [7M]

SECTION- V

10.a) Explain Applet life cycle with neat diagram? [7M]

b**)** Explain any three Swing components? [7M]

(OR)

11) Write a program for Calculator using Swings? [14M]

****

R17

Code No: xxxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

QUESTION PAPER

JAVA PROGRAMMING

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

1). Explain Constructor Overloading and Method Overloading with example program? [14M]

(OR)

2. a) Explain different Operators in Java with examples [7M]

b) Explain different String Handling methods with examples? [7M]

SECTION-II

3. a)Explain Dynamic binding with example program? [7M]

b)What is an interface? Explain how to extend an interface with program? [7M]

(OR)

4. a)Explain different Access Specifiers in java? [7M]

b) Explain about this keyword and built in packages? [7M]

SECTION-III

5. a) Explain throw and throws keyword with example program? [7M]

b)Explain nested try block with example program? [7M]

(OR)

6 a) Explain Thread Synchronization with example program? [7M]

b) Explain about Interrupting thread with example program? [7M]

SECTION- IV

7). Explain Stack class, Random class and Scanner class with example program? [14M]

(OR)

9. a)Explain RandomAccessFile methods with example program? [7M]
b) Write a program to insert data in to the database using JDBC? [7M]

SECTION- V

10.a) Explain Adapter class with example program? [7M]

b**)** Difference between Applets and Applications? [7M]

(OR)

11) Explain Event classes and Event Listeners in Event handling Mechanism [14M]

****

R17

Code No: xxxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

QUESTION PAPER

JAVA PROGRAMMING

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

1). Explain about Java Buzz words or Features and History of java [14M]

(OR)

2. a) Explain about Garbage Collector in java ? [7M]

b) Explain this keyword with example program? [7M]

SECTION-II

3. a)Explain Object class Methods with example? [7M]

b)Explain difference between Abstract class and Interface? [7M]

(OR)

4. a)Explain about super keyword with example program? [7M]

b) Explain how multiple inheritance is supported in java? Justify [7M]

SECTION-III

5. a) What is Exception? Explain Built in Exceptions in java [7M]

b)What is User defined Exception? Explain User defined Exception with program [7M]

(OR)

6 a) Explain about Thread Group in java with program? [7M]

b) Explain Daemon Thread with example program? [7M]

SECTION- IV

7). Explain Calendar class and Random class with example program? [14M]

(OR)

9. a) Explain different steps for creating JDBC? [7M]
b) Write a program to delete data from the database using JDBC? [7M]

SECTION- V

10.a) Explain about Delegation Event Model? [7M]

b**)** Explain how to pass parameters to an applet with program [7M]

(OR)

11) Explain Swing components [14M]
i) JButton ii) JLabel iii) JTextfield iv) JTextArea

****

R15

Code No: **R15A0507**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, April/May 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.

PART – A **(25 Marks)**

1. (a)Distinguish between C++ and JAVA [2M].
(b) What is nested class in java? [3M]
(c) How do java programs maintain platform independency with the help of JVM? [2M]
(d) Write short note on Interface. [3M]
(e) What is CLASSPATH ? [2M]
(f) Explain the life cycle of an applet. [3M]
(g) What is synchronization? [2M]
(h) Differentiate AWTs and swings [3M]
(i) Write short notes this keyword?[2M]
(j) Explain the life cycle of thread [3M]

PART – B **(50 Marks)**

SECTION – I

2. A) How do java programs maintain platform independency with the help of JVM? [5M]
B) Explain the constructor over loading with example? [5M]

(OR)

3. A) What are the benefits of Object Oriented Programming? [5M]
B) Explain the access specifiers of java language with examples. [5M]

SECTION – II

4. Define Inheritance? What are the different types of Inheritances? Explain. [10M]

(OR)

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

SECTION – III

6. What are different types of exceptions in Java? Why do you need to catch an exception in Java? Explain. [10M]

(OR)

7. What is the difference between multiprocessing and multithreading? What is to be done to implement these in a program? [10M]

SECTION – IV

8. Write a program that reads from the user the name of a text file, counts the word frequencies of all words in the file, and outputs a list of words and their frequency. [10M]

(OR)

9. Discuss the four types of JDBC drivers with suitable diagrams. [10M]

SECTION – V

10. Develop an applet program to change the foreground and background colors and to display the message in the order in which the init(), start() and paint() methods are called. [10M]

(OR)

11. Explain briefly any four layout managers in Java with examples. [10M]

****