Hall Ticket Number :

R-14

Code: 4G143

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Formal Languages and Automata Theory

(Computer Science & Engineering)

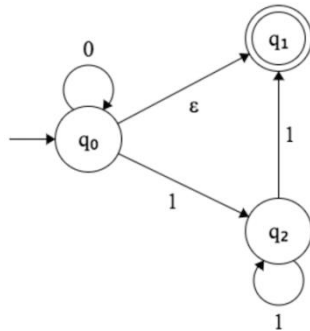Max. Marks: 70   Time: 3 Hours

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

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UNIT–I

1. a) List the applications of finite automata.   7M

    b) Define Chomsky hierarchy of languages.   7M
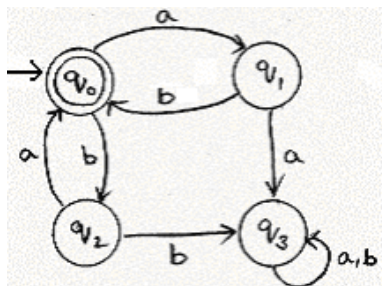
OR

2. a) Consider the following NFA-∈

   i.   Compute the ∈ - closure of each state

   ii. Remove ∈-Moves for the given NFA-∈.   8M

    b) Distinguish between DFA and NFA.   6M

UNIT–II

3. a) Construct a DFA for the regular expression r = (a+b)*abb   9M

    b) Define recursive definition of Regular Expression   5M

OR

4. a) Construct the regular expression accepted by following finite automaton.

8M

    b) Describe a pumping lemma. What are its applications?   6M

UNIT–III

5. a) Construct left linear and right linear grammar for the language.

        (((01 + 10)* 11)* 00)*   8M

    b) Find the left most and right most derivations for the given grammar for the string

        abbba

        S → abB

        A → aaBb

        B → bbAa

        A → ∈   6M

OR

6. a) Convert the following grammar to GNF

   S → Ba/ab

   A → aAB/a

   B → ABb/b   8M

   b) Discuss the Pumping lemma for Context Free Languages concept with example {$a^n b^n c^n$ where n>=0}.   6M

UNIT–IV

7. a) Differentiate PDA by empty stack and final state by giving their definitions.   6M

   b) Construct PDA to accept the set of all strings of palindromes over {a, b}   8M

OR

8. a) Construct PDA to accept the CFG

   S-> aABC

   A -> aB/C

   B -> bA/b

   C -> a   9M

   b) Define DPDA and DCFL   5M

UNIT–V

9. a) Explain various types of Turing machines.   6M

   b) Construct Turing Machine to compute addition function for two unary numbers f(X,Y) = X+Y   8M

OR

10. a) Construct LR(0) items for the grammar given, find its equivalent DFA.

   $S' → S$

   $S → A S | \lambda$

   $A → a A | b$ λ is null.   9M

   b) Explain about the Post's Correspondence Problem   5M

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II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018
Computer Organization
(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)
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UNIT–I

1. a) Explain about multi processors and multi computers.   7M

    b) What is meant by odd parity and even parity? Explain them.   7M

OR

2. a) Distinguish between error detection and correction codes   7M

    b) Registers R1 and R2 of a computer contain the decimal values 12000 and 6000 respectively. What is the effective address of the memory operand in each of the following instructions?

    i) MOV 20 (R1), R5   ii) STORE R5, 30 (R1, R2)

    iii) LOAD #3000, R5   iv) ADD - (R2), R5   7M

UNIT–II

3. a) What is an addressing mode? List various addressing modes and write brief notes on each.   8M

    b) For the pattern X= (A+B)*(C+D), explain three-, two-, one- and zero-address instructions by giving the syntax.   6M

OR

4. a) Explain the Memory reference instructions with suitable examples?   7M

    b) Briefly explain the arithmetic logic shift unit.   7M

UNIT–III

5. What are the design goals while designing the Control Unit? Explain the Hardwired control and Micro programmed control. Mention their advantages and disadvantages.   14M

OR

6. a) What is microprogramming? Compare hard-wired control and micro-programmed control.   7M

    b) What are the two methods to reduce the number of microinstructions needed by the control unit? Explain, in detail, with suitable examples.   7M

UNIT–IV

7. a) Perform the 2's complement multiplication for the signed integer operands: (-13) * (-10) using Booth's recoding scheme   7M

    b) Derive and explain an algorithm for adding and subtracting 2 floating point binary numbers.   7M

OR

8. a) Explain division algorithm with example   7M

    b) Explain different types of mapping functions in cache memory.   7M

UNIT–V

9. a) What are handshaking signals? Explain the handshake control of data transfer during input and output operation.   7M

    b) What is meant by instruction pipeline? Explain   7M

OR

10. What is Direct Memory Access (DMA)? What is the need for DMA? Explain the working of DMA. Also mention its advantages.   14M

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Code: 4G441

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

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)

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UNIT–I

1.　a)　Explain the responsibilities of Database Administrator.　　7M

　　b)　When would you store data in a DBMS instead of in operating system file?　　7M

OR

2.　a)　What is transaction? What guarantees does a DBMS offer w.r.t transactions?　　7M

　　b)　Explain the differences between external, internal and conceptual schemas. How are these different schema layers related to the concepts of logical and physical data independence.　　7M

UNIT–II

3.　a)　Construct an E-R diagram for a car insurance company with a set of customers, each of whom owns a number of cars. Each car has a number of recorded accidents associate with it.　Determine the entities and relationships that exists between the entities.　　8M

　　b)　Define the following terms:
　　　　i)　Relationship　ii) Relationship set　iii) Descriptive attribute　　6M

OR

4.　a)　What are integrity constraints? Define the terms primary key constraint and foreign key constraint. How are these constraints expressed in SQL?　　6M

　　b)　How can we translate an E-R diagram into SQL statements to create tables? How are entity sets mapped into relations? How are relationship sets mapped?　　8M

UNIT–III

5.　a)　What is a trigger? What re its three parts? What are the differences between row-level and statement-level triggers?　　6M

　　b)　Consider the following relations:

　　　Student(snum: integer, sname: string, major: string, level: string, age: integer)

　　　Class(name: string, meets at: string, room: string, fid: integer)

　　　Enrolled(snum: integer, cname: string)

　　　Faculty(fid: integer, fname: string, deptid: integer)

　　　Enrolled has one record per student-class pair such that the student is enrolled in the class.

　　　Write the following queries in SQL.

　　　i. Find the names of all Juniors (level = JR) who are enrolled in a class taught by I. Teach.

　　　ii. Find the age of the oldest student who is either a History major or enrolled in a course taught by I. Teach.　　8M

OR

6. a) Explain commit, rollback and savepoint in PL/SQL.   5M

    b) Consider the following schema:

    Suppliers(sid: integer, sname: string, address: string)

    Parts(pid: integer, pname: string, color: string)

    Catalog(sid: integer, pid: integer, cost: real)

    The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:

    1. Find the pnames of parts for which there is some supplier.

    2. Find the snames of suppliers who supply every part.

    3. Find the snames of suppliers who supply every red part.   9M

UNIT–IV

7. a) Show that if a relation schema is in BCNF, then it is also in 3NF.   7M

    b) Why some functional dependencies are called trivial?   7M

OR

8. a) What is schema refinement? Explain the problems caused by redundancy.   6M

    b) What is functional dependency and multivalued dependency? Explain 4NF with an example.   8M

UNIT–V

9. a) Explain ACID properties.   7M

    b) How are transactions created and terminated in SQL? Explain why savepoints and chained transactions are useful.   7M

OR

10. a) How is data organized in a hash-based index? When would you use a hash-based index?   7M

    b) What are the main differences between ISAM and B+ tree indexes?   7M

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