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15CS/IS52

Fifth Semester B.E. Degree Examination, June/July 2018
Computer Networks

Time: 3 hrs.   Max. Marks: 80

**Note: Answer any FIVE full questions, choosing
ONE full question from each module.**

Module-1

1   a. What are the different types of transport services provided by the internet? (08 Marks)
    b. Compose logical note on proxy–server with suitable diagram. (08 Marks)

OR

2   a. Discuss how files are distributed in peer-to-peer application. (08 Marks)
    b. Design network application using socket programming with UDP. (08 Marks)

Module-2

3   a. Describe the various fields of UDP segment. Explain how Checksum is calculated. (08 Marks)
    b. Design rdt 2.0 protocol. (08 Marks)

OR

4   a. With a neat sketch, explain the TCP segment and its services. (08 Marks)
    b. Explain how connection is established and tear down in TCP. (08 Marks)

Module-3

5   a. Draw IPv6 datagram format, mention the significance of each fields. (08 Marks)
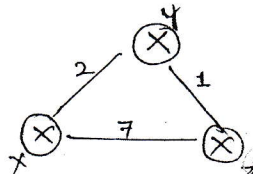   b. Apply distance –vector algorithm for the following Fig.Q5(b). (08 Marks)

Fig.Q5(b)

OR

6   a. Illustrate Routing Information Protocol (RIP) with suitable diagram. (08 Marks)
    b. Explain the spanning tree algorithm. (08 Marks)

Module-4

7   a. Define cellular network. Give the overview of GSM cellular network architecture. (08 Marks)
    b. Explain the two different types of routing approaches to mobile node. (08 Marks)

OR

8   a. Explain the following concepts of mobile–IP : i) Agent discovery ii) Registration with home agent. (08 Marks)
    b. Illustrate the steps involved when a base station does decide to hand-off a mobile user. (08 Marks)

Module-5

9   a. Brief out three broad categories of multimedia network applications. (08 Marks)
    b. Discuss the followings :   i) Adaptive streaming ii) DASH. (08 Marks)

OR

10 a. With general format, explain the various fields of RTP. (08 Marks)
    b. Explain the working procedure of leaky bucket algorithm. (08 Marks)

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CBCS Scheme

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Fifth Semester B.E. Degree Examination, June/July 2018
Database Management Systems

Time: 3 hrs.   Max. Marks: 80

Note: *Answer any FIVE full questions, choosing one full question from each module.*

Module-1

1   a.   Discuss the main characteristics of the database approach and how it differs from traditional file systems. **(04 Marks)**

    b.   Describe the three – schema architecture. Why do we need mappings among schema levels? **(04 Marks)**

    c.   Discuss various components of a DBMS, with a neat diagram. **(08 Marks)**

OR

2   a.   Define an Entity and Attribute. Explain the different types of attributes that occur in an ER – diagram model, with an example. **(06 Marks)**

    b.   Draw an ER – diagram of an Airline reservation system, taking into account at least five entities. Indicate all keys, constraints and assumptions that are made. **(10 Marks)**

Module-2

3   a.   Explain the data types available for attribute specification in SQL. **(04 Marks)**

    b.   Explain briefly violations in entity integrity constraint, key and referential integrity constraints, with example. **(06 Marks)**

    c.   Consider the following RESORT database,
    RESORT (resortno, resortname, resorttype, resortaddr, resortcity, numsuite)
    SUITE(suiteno, resortno, suiteprice)
    RESERVATION (reservationno, resortno, visitorno, checkin, checkout, totalvisitor, suiteno)
    VISITOR (visitorno, firstname, lastname, visitoraddr)
    i) Write the SQL to list full details of all the resorts on Los Angeles.
    ii) Write the SQL to list full details of all the resorts having number of suites more than 30.
    iii) Write the SQL to list visitors in ascending order by firstname. **(06 Marks)**

OR

4   a.   Explain how constraints are specified in SQL during table creation, with suitable example. **(04 Marks)**

    b.   Consider the following relations for a database that keeps track of student enrollment in courses and the books adopted for each course : **(06 Marks)**
    STUDENT (SSn, Name, Major, bdate)
    COURSE (Courseno, Cname, dept)
    ENROLL (SSn, Courseno, Quarter, grade)
    BOOK_ADOPTION (Courseno, Quarter, book_isbn)
    TEXT (book_isbn, book_title, Publisher, Author)
    Write the following queries in relational algebra on the database schema :
    i) List the number of courses taken by all students named John Smith in winter 2009 (i.e. Quarter = WO9).
    ii) Produce a list of text books (include courseno, book_isbn, book_title) for courses offered by the 'CS' department that have used more than two books.
    iii) List any department that has all its adopted books published by 'Pearson' publishing.

    c.   Give an example of mapping of generalization or specialization into relation schemas. **(06 Marks)**

Module-3

5 a. Discuss how each of the following constructs is used in SQL and discuss the various options for each construct : **(06 Marks)**
   i) Nested Queries   ii) Aggregate functions   iii) Triggers   iv) Views and their updatability   v) Schema change statements   vi) Group by and having clause.

   b. Draw and explain 3 – tier Architecture and technology relevant to each tier. Write the advantages of 3 – tier architecture. **(06 Marks)**

   c. What is CGI? Why was CGI introduced? What are the disadvantages of an architecture using CGI scripts? **(04 Marks)**

OR

6 a. What is Dynamic SQL and how is it different from Embedded SQL? **(04 Marks)**

   b. What is SQL J and how is it different from JDBC? **(04 Marks)**

   c. Consider the following company database :
   EMP (Name, Ssn , Salary, Superssn, dno)
   DEPT (dnum, dname, mgrssn)
   DEPT_LOC (dnum, dlocation)
   PROJECT (Pname, Pnumber, Plocation, dnum)
   WORKS_ON (Essn, Pno, Hours)
   DEPENDENT (Essn, dept_name, sex)
   Write SQL queries for the following :
   i)   Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees.
   ii) Retrieve the names of employees who make atleast 10,000 more than the employee who is paid the least in the company.
   iii) A view that has the employee name, supervisor name and employee salary for each employee who works in the 'Research' department.
   iv) A view that has the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it. **(08 Marks)**

Module-4

7 a. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with examples. **(04 Marks)**

   b. Define Multivalued dependency. Explain fourth normal form, with an example. **(06 Marks)**

   c. Consider the Universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies F = {{A, B}→ {C}, {A}→ {D, E}, {B}→ {F} ,{F}→ {G, H},{D}→{I, J}}. What is key of R? Decompose R into 2NF and then 3NF relations. **(06 Marks)**

OR

8 a. Define Non – additive join property of a decomposition and write an algorithm of testing for non – additive join property. **(04 Marks)**

   b. A relation R(A, C, D, E, H) satisfies the following FDs : $A \rightarrow C$, $AC \rightarrow D$, $E \rightarrow AD$, $E \rightarrow H$ Find the Canonical cover for this set of FD's. **(06 Marks)**

   c. Consider two set of functional dependencies :
   $F = \{A \rightarrow C, AC \rightarrow D , E \rightarrow AD , E \rightarrow H\}$ and $G = \{A \rightarrow CD , E \rightarrow AH\}$.
   Are they equivalent? **(06 Marks)**

Module-5

9 a. Discuss ACID properties of a database transaction. **(04 Marks)**
b. Explain transaction support in SQL. **(06 Marks)**
c. Discuss the UNDO and REDO operations and the recovery techniques that use each.
(06 Marks)

OR

10 a. What is two – phase locking protocol? How does it guarantee serializability? **(04 Marks)**
b. What is Serializability? How can serializability be ensured? Do you need to restrict concurrent execution of transaction to ensure serializability? Justify your answer.
(06 Marks)
c. Discuss the time – stamp ordering protocol for concurrency control. **(06 Marks)**

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CBCS SCHEME

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Fifth Semester B.E. Degree Examination, June/July 2018
Automata Theory and Computability

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1   a. With a neat diagram, explain a hierarchy of language classes in automata theory.   **(04 Marks)**
     b. Define deterministic FSM. Draw a DFSM to accept decimal strings which are divisible by 3.
                                                                                          (06 Marks)
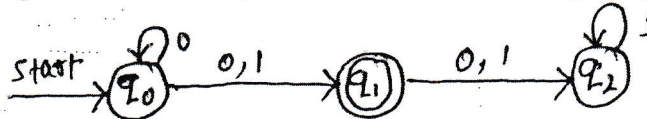   c. Convert the following NDFSM to its equivalent DFSM. (Refer Fig.Q.1(c)).

Fig.Q.1(c)

Also write transition table for DFSM.   **(06 Marks)**

OR

2   a. Minimize the following finite automata, (Refer Fig.Q.2(a)).   **(06 Marks)**
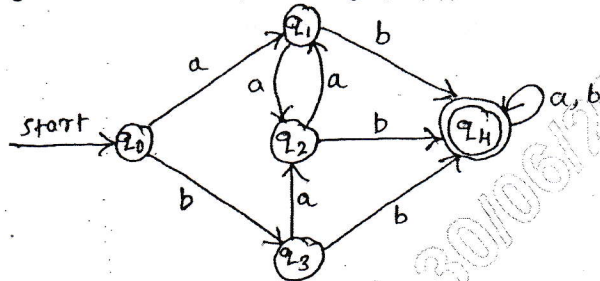

Fig.Q.2(a)

     b. Construct a mealy machine for the following:
        i)   Design a mealy machine for a binary input sequence. Such that, if it has a substring 101, the machine outputs A. If input has substring 110, the machine outputs B. Otherwise it outputs C.
        ii) Design a mealy machine that takes binary number as input and produces 2's complement of that number as output. Assume the string is read from LSB to MSB and end carry is discarded.   **(06 Marks)**
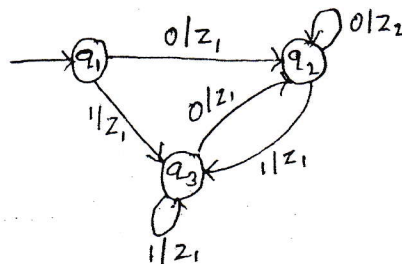   c. Convert the following mealy machine to Moore machine. (Refer Fig.Q.2(c)).   **(04 Marks)**

Fig.Q.2(c)

Module-2

3 a. Define regular expression. Obtain a regular expression for the following languages:
   i) $L = \{a^n b^m | m + n \text{ is even}\}$.
   ii) $L = \{a^n b^m | m \geq 1, n \geq 1, nm \geq 3\}$
   iii) $L = \{w : |w| \mod 3 = 0 \text{ where } w \in (a, b)^*\}$. (08 Marks)

   b. Design an NDFSM that accept the language $L(aa^*(a + b))$. (04 Marks)

   c. Convert the regular expression $(0 + 1)^* 1(0 + 1)$ to NDFSM. (04 Marks)

OR

4 a. If the regular grammars define exactly the regular language, then prove that the class of languages that can be defined with regular grammars is exactly the regular languages. (04 Marks)

   b. Prove that the regular languages are closed under complement, intersection, difference, reverse and letter substitution. (08 Marks)

   c. State and prove pumping theorem for regular language. (04 Marks)

Module-3

5 a. Define a context-free grammar. Obtain the grammar to generate the language $L = \{w | n_a(w) = n_b(w)\}$. (04 Marks)

   b. For the regular expression $(011 + 1)^*(01)^*$ obtain the context free grammar. (04 Marks)

   c. What is ambiguity? Show that the following grammar is ambiguous.
   $$S \rightarrow aB | bA$$
   $$A \rightarrow aS | bAA | a$$
   $$B \rightarrow bS | aBB | b.$$
   (08 Marks)

OR

6 a. Define PDA (Push Down automata). Obtain a PDA to accept the language $L(M) = \{wCw^R | wt(a + b)^*\}$, where WR is reverse of W by a final state. (08 Marks)

   b. For the grammar:
   $$S \rightarrow aABB | aAA$$
   $$A \rightarrow aBB | a$$
   $$B \rightarrow bBB | A$$
   $$C \rightarrow a$$
   Obtain the corresponding PDA. (04 Marks)

   c. Obtain a CFG for the PDA shown below:
   $f(q_0, a, Z) = (q_0, AZ)$
   $f(q_0, a, A) = (q_0, A)$
   $f(q_0, b, A) = (q_1, \varepsilon)$
   $f(q_1, \varepsilon, Z) = (q_2, \varepsilon)$.
   (04 Marks)

Module-4

7 a. Consider the grammar

$S \rightarrow 0A | 1B$

$A \rightarrow 0AA | 1S | 1$

$B \rightarrow 1BB | 0S | 0$

Obtain the grammar in CNF. (08 Marks)

   b. Show that $L = \{a^n b^n c^n | n \geq 0\}$ is not context free. (08 Marks)

OR

8 a. With a neat diagram, explain the working of a basic Turing machine. (04 Marks)

   b. Obtain a Turing machine to accept the language $L = \{0^n 1^n | n \geq 1\}$. (08 Marks)

   c. Briefly explain the techniques for TM construction. (04 Marks)

Module-5

9 a. Obtain a Turing machine to recognize the language $L = \{0^n 1^n 2^n | n \geq 1\}$. (08 Marks)

   b. Prove that $HALT_{TM} = \{(M, W) | $ the Turing machine M halts on input W$\}$ is undecidable. (04 Marks)

   c. With example, explain the quantum computation. (04 Marks)

OR

10 Write a short note on:
   a. Multiple Turing machine
   b. Non deterministic Turing machine
   c. The model of linear bounded automaton
   d. The post correspondence problem. (16 Marks)

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USN | | | | | | | | | | | **15CS553**

Fifth Semester B.E. Degree Examination, June/July 2018
Advanced Java and J2EE

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1. a. What is an Enumeration? Explain with an example. **(05 Marks)**
    b. Demonstrate how enumerations can be applied as class types. **(05 Marks)**
    c. Discuss Auto boxing/unboxing in Java with an example. **(06 Marks)**

OR

2. a. What is an Annotation? Explain various retention policies for annotations in java. **(05 Marks)**
    b. Discuss how reflections can be used at runtime with annotations. **(06 Marks)**
    c. Demonstrate single member annotations with an example. **(05 Marks)**

Module-2

3. a. Discuss the following collection interfaces: i) Set ii) List. **(08 Marks)**
    b. Demonstrate linked list for collections with an example. **(08 Marks)**

OR

4. a. Explain how collections can be accessed using an iterator. **(08 Marks)**
    b. Explain the following legacy classes with an example: i) Hashtable   ii) Vector. **(08 Marks)**

Module-3

5. a. Explain why do we need strings. Briefly explain different ways of creating strings. **(05 Marks)**
    b. Write a program to remove duplicate characters in a given string and display new string without any duplicates. **(05 Marks)**
    c. Explain how strings can be modified in Java with different methods. **(06 Marks)**

OR

6. a. What String Buffer? Explain how it is different from strings. **(06 Marks)**
    b. Explain the following String Buffer methods: i) insert ( )   ii) append ( )   iii) substring ( ) iv) replace ( ). **(06 Marks)**
    c. Explain how to check the occurrences of a substring or characters in a given string. **(04 Marks)**

Module-4

7. a. Explain the life cycle of a servlet. **(04 Marks)**
    b. Demonstrate how servlet can accept parameters from HTML. **(06 Marks)**
    c. Explain how cookies can be handled using servlets. **(06 Marks)**

OR

8. a. Explain how session trading can be done with servlets. **(04 Marks)**
    b. Demonstrate how parameters can be accessed from HTML using JSP. **(06 Marks)**
    c. Explain how cookies can be handled using JSP. **(06 Marks)**

Module-5

9. a. List and explain various JDBC driver types. **(09 Marks)**
    b. Explain what are the basic steps involved in database connection. **(07 Marks)**

OR

10. a. List and explain various statement objects in JDBC. **(07 Marks)**
    b. What is Result set? Explain types of Result sets in JDBC. **(05 Marks)**
    c. Explain the types of exceptions occurred in JDBC. **(04 Marks)**

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USN | | | | | | | | | | 15CS565

Fifth Semester B.E. Degree Examination, June/July 2018
Cloud Computing

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define cloud computing? Explain its characteristics and benefits. (05 Marks)
 b. Discuss the machine reference model of execution virtualization. (06 Marks)
 c. List and explain pros and cons of virtualization. (05 Marks)

OR

2 a. With the help of neat diagram, explain the cloud computing reference model. (05 Marks)
 b. List and explain the various cloud computing platforms and techniques. (06 Marks)
 c. Explain the characteristics of virtualized environments. (05 Marks)

Module-2

3 a. What is IaaS? Explain its reference implementation with a neat diagram. (08 Marks)
 b. Write a note on: i) Community cloud   ii) Foundation services in Aneka. (08 Marks)

OR

4 a. With a neat diagram, explain the PaaS reference model. (08 Marks)
 b. With a neat diagram, explain the Aneka framework overview. (08 Marks)

Module-3

5 a. Define Tread? Explain the relation between process and thread with relevant diagram. (05 Marks)
 b. List out the difference between Aneka thread Vs common thread. Explain any two of them in detail. (06 Marks)
 c. Explain parameter sweep application with example. (05 Marks)

OR

6 a. List and explain 2 types of threads API's provided for thread programming. (05 Marks)
 b. Explain Aneka thread application model with simple application. (06 Marks)
 c. Describe MPI programs structure with a neat diagram. (05 Marks)

Module-4

7 a. What is data intensive computing? Describe the open challenges in data intensive computing. (05 Marks)
 b. Discuss the features of Google File System and Amazon Simple Storage Service (S3) (05 Marks)
 c. Explain MapReduce scheduling service of Aneka with a neat diagram. (06 Marks)

OR

8 a. What does the term NOSQL mean? Explain Google Bigtable with its architecture. (05 Marks)
 b. Explain MapReduce Execution Service of Aneka with diagram. (06 Marks)
 c. Explain Google Map programming model. (05 Marks)

Module-5

9 a. Explain the various compute service provided by Amazon, web service. (05 Marks)
 b. With a neat diagram, explain the Google AppEngine platform architecture. (06 Marks)
 c. Describe how cloud computing technology can be applied to support ECG monitoring. (05 Marks)

OR

10 a. Explain the concept of S3 provided by Amazon web services. (05 Marks)
 b. Explain Microsoft windows Azure Platform architecture with diagram. (06 Marks)
 c. Describe an application of cloud technologies for online gaming. (05 Marks)

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