CBCS SCHEME

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15CS52

Fifth Semester B.E. Degree Examination, Aug./Sept. 2020
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. Explain how interaction occurs between web browser and web server using HTTP message. Explain HTTP request message format. **(06 Marks)**

b. Give the importance of SMTP in the internet mail system. **(05 Marks)**

c. Explain how client requesting object through web cache. **(05 Marks)**

OR

2 a. How FTP moves files between local and remote file system? List the commands used in FTP. **(06 Marks)**

b. Explain POP3 (Post Office Protocol Version 3). **(04 Marks)**

c. Explain the steps involved in interaction of various DNS servers. **(06 Marks)**

Module-2

3 a. Explain stop wait protocol with FSM representation rdt 2.0. **(06 Marks)**

b. Explain TCP segment structure. **(06 Marks)**

c. With a neat diagram, explain GO – BACK – N protocol. **(04 Marks)**

OR

4 a. Explain the steps involved in TCP connection establishment using three way hand shaving. **(06 Marks)**

b. What do you mean by congestion control? Explain slow start mechanism. **(05 Marks)**

c. Define flow control. Explain how flow is controlled by receiver window and receiver buffer. **(05 Marks)**

Module-3

5 a. Define routing. What are the goals of routing algorithm? **(05 Marks)**

b. A host in an organization has an IP address 200·45·34·56 and subnet address mask 200·455·240·0. What is subnet address? **(04 Marks)**

c. Explain the format of IPv6 headers. **(07 Marks)**

OR

6 a. Explain OSPF. **(06 Marks)**

b. Find shortest path from noole1 using link state algorithm.

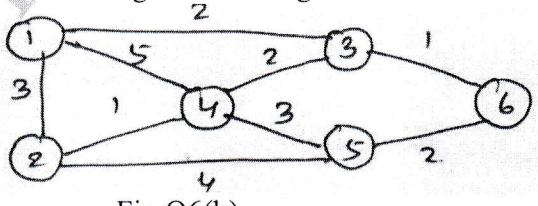

Fig.Q6(b) **(05 Marks)**

c. Explain RIP(Routing Information Protocol) with its message format. **(05 Marks)**

Module-4

7 a. Explain 3G cellular data network. (06 Marks)
b. Write a note on mobile IP. (06 Marks)
c. Explain in brief how mobility is managed in cellular networks. (04 Marks)

OR

8 a. What is handoffs? Explain steps involved when a base station does decide to handoff a mobile user. (06 Marks)
b. With neat diagram, explain agent advertisement and mobile IP registration. (05 Marks)
c. Write a note on indirect routing to mobile node. (05 Marks)

Module-5

9 a. Give the classification of multimedia application. Explain in brief. (04 Marks)
b. Explain Content Distribution Networks (CDN) and its operation. (06 Marks)
c. Explain how interaction takes place between client and server for HTTP streaming. (06 Marks)

OR

10 a. Define policing. Mention 3 important policing criterias. (05 Marks)
b. Explain weighted fair queuing. (05 Marks)
c. Write a note on Diffserv. (06 Marks)

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15CS53

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Database Management System

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 advantages of using the DBMS approach. **(06 Marks)**

b. Explain three-schema architecture with a neat diagram. Why do we need mapping between schema levels? **(06 Marks)**

c. What is Data Independent? Explain different types of Data Independence. **(04 Marks)**

OR

2 a. Explain the component modules of DBMS and their interaction with a neat diagram. **(06 Marks)**

b. Explain different types of attributes that occur in ER model with an example. **(06 Marks)**

c. Design a ER diagram for keeping track of information about Bank database taking into an account atleast four entities. **(04 Marks)**

Module-2

3 a. Discuss the characteristics of relations that make them different from ordinary tables and files. **(08 Marks)**

b. Explain the steps to convert the basic ER model to relational database schema. **(08 Marks)**

OR

4 a. What are the basic data types available for attributes in SQL? Explain with example. **(06 Marks)**

b. Define foreign key. Explain all possible options that can be specified when a referential integrity constraint is violated. **(04 Marks)**

c. Write the SQL syntax with example for the following :
(i) ALTER (ii) INSERT (iii) UPDATE **(06 Marks)**

Module-3

5 a. Explain the following with an example.
(i) Correlated nested queries
(ii) Assertions. **(06 Marks)**

b. Explain aggregate functions in SQL with example. **(04 Marks)**

c. Consider the following tables:
WORKS(Pname, Cname, Salary)
LIVES(Pname, Street, City)
LOCATED_IN(Cname, City)
MANAGER(Pname, Mgrname)
Write the SQL Query for the following :
(i) Retrieve the names of the people who work for Wipro along with the address they live in.
(ii) Retrieve the name of the person who gets second highest salary.
(iii) Find the number of employee and average salary of each company. **(06 Marks)**

OR

6 a. Explain the following with an example:
(i) Cursor
(ii) Database Stored Procedure. (08 Marks)
b. Explain the Standard Three-Tier Architecture and list the advantages. (08 Marks)

Module-4

7 a. What is Functional Dependency? Explain the inference rules for functional dependency with proof. (08 Marks)
b. Define 1NF, 2NF and 3NF by taking an example. (08 Marks)

OR

8 a. Write an algorithm to find a minimal cover for a set of functional dependencies. (04 Marks)
b. Find the closure sets with respect to F.
F = {ssn → {Ename, Bdate, Address, Dnumber}, Dnumber → {Dname, Dmgr_ssn}} (04 Marks)
c. Which normal form is based on the concept of multivalue functional dependency? Explain the same with example. (08 Marks)

Module-5

9 a. What are the problems faced when concurrent transactions are executed in an uncontrolled manner? Give an example and explain. (06 Marks)
b. With a neat diagram explain the states for transaction execution. (06 Marks)
c. Briefly explain the desirable properties of transactions. (04 Marks)

OR

10 Write a note on :
a. Timesamp ordering (08 Marks)
b. NO-UNDO/REDO recovery algorithm. (08 Marks)

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15CS/IS54

Fifth Semester B.E. Degree Examination, Aug./Sept. 2020
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. Define the following with examples :
i) String ii) Language **(04 Marks)**

b. Explain various functions on languages. **(02 Marks)**

c. Draw the deterministic Finite State Machine for the following :
i) To accept decimal string divisible by 3 over the alphabet $\sum = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$
ii) To accept odd number of a's and even number of b's over alphabet. $\sum = \{a,b\}$ **(10 Marks)**

OR

2 a. Write an algorithm for deterministic FSM simulator. **(04 Marks)**

b. Convert the following Non – deterministic FSM to Deterministic FSM using subset construction method. (Ref. Fig Q2(b)) **(08 Marks)**

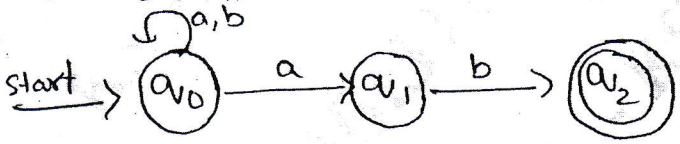

Fig Q2(b)

c. Describe standard bar code reader and write its Finite State Machine diagram. **(04 Marks)**

Module-2

3 a. What is Regular expression? And mention the applications of regular expression. **(03 Marks)**

b. Find the regular expression for the following Languages :
i) To accept strings of 0's and 1's having no two consecutive 0's
ii) $L = \{a^n b^m \mid m \geq 1, n \geq 1, nm \geq 3\}$ **(06 Marks)**

c. Obtain a regular expression using Kleene's theorem for the finite automata shown below in Fig Q3(c)

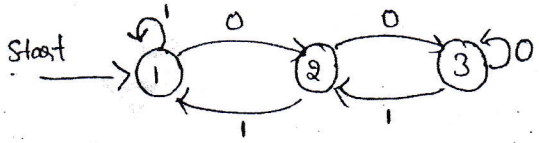

Fig Q3(c) **(07 Marks)**

OR

4 a. State and prove pumping lemma theorem for Regular language. **(07 Marks)**

b. Prove that the regular languages are closed under complement, intersection, difference, reverse and letter substitution. **(05 Marks)**

c. State and prove : "The Regular languages are closure under union, concatenation and Kleene's Star". **(04 Marks)**

Module-3

5 a. Define Context – Free Grammar (CFG). Design CFG for the following language.
   i) To generate the strings of balanced parentheses
   ii) $L = \{0^m 1^m 2^n \mid m \geq 1 \text{ and } n \geq 0\}$ **(08 Marks)**

b. What is ambiguous grammar? Show that the following grammar is ambiguous.
$E \rightarrow E + E \mid E * E \mid (E) \mid id$
Write the left most derivation for the string "id + (id * id)" **(08 Marks)**

OR

6 a. Define Deterministic PDA with example. **(04 Marks)**

b. Obtain PDA to accept the language.
$L = \{WCW^R \mid W \in (a + b)^*\}$ where W^R is reverse of W by a final state. **(07 Marks)**

c. Convert the following CFG to an equivalent PDA.
$S \rightarrow aABB \mid aAA$
$A \rightarrow aBB \mid a$
$B \rightarrow bBB \mid A$
$C \rightarrow a$ **(05 Marks)**

Module-4

7 a. Prove that "The Context – Free Language properly contain the Regular languages". **(04 Marks)**

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

c. Prove that "Context – Free Language are non closure under intersection". **(04 Marks)**

OR

8 a. Define Turing Machine. Explain the working of a Turning machine model. **(06 Marks)**

b. Design a turning machine that accepts $L = \{0^n 1^n \mid n \geq 1\}$. Write the transition diagram for the same and also indicate the moves made by the turning machine for the input '0011'. **(10 Marks)**

Module-5

9 a. Write short notes on :
   i) Multitape Turning Machine
   ii) Model of Linear Bounded Automation. **(10 Marks)**

b. Prove that "$HALT_{TM} = \{(M, W) \mid$ The Turning machine M halts on input W is undecidable". **(06 Marks)**

OR

10 a. Prove that "The growth rate of any exponential functional is greater than that of any polynomial". **(08 Marks)**

b. Write short note on :
   i) Quantum Computers
   ii) Church Turning Thesis. **(08 Marks)**

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15CS553

Fifth Semester B.E. Degree Examination, Aug./Sept. 2020
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 are Enumerations? Explain its two predefined methods with example. **(07 Marks)**
b. Briefly, explain Numeric Type wrappers. **(05 Marks)**
c. Describe Four annotations which are imported from java.long.annotations. **(04 Marks)**

OR

2 a. Elaborate special kind of annotation that contains no members with its class. **(07 Marks)**
b. Explain two important features of JAVA added beginning with JDK 5. **(07 Marks)**
c. Give the construction of Enumeration with its example. **(02 Marks)**

Module-2

3 a. What are the various changes that collection framework underwent recently? **(05 Marks)**
b. Explain the methods defined by Deque. **(07 Marks)**
c. Explain the Array list class of collection classes. **(04 Marks)**

OR

4 a. With an Example program. Explain how to store user-Defined classes in collections. **(07 Marks)**
b. Mention and explain different interfaces that support maps. **(06 Marks)**
c. Mention any four Legacy methods defined by vector. **(03 Marks)**

Module-3

5 a. Briefly describe special string operations with syntax and examples. **(06 Marks)**
b. Explain the following concepts
i) charAt ( )
ii) getChar( )
iii) append ( )
iv) reverse( ). **(10 Marks)**

OR

6 a. Explain any five Additional string buffer methods. **(07 Marks)**
b. Write the Java program which prompts the user for the name of a state and than displays that states capital. **(07 Marks)**
c. Explain String Builders. **(02 Marks)**

Module-4

7 a. Explain Five types of JSPTags. **(06 Marks)**

b. Describe the core interfaces that are provided in Javax.Servlet.http pakage. **(06 Marks)**

c. Write a program to show how to use defining and calling method using JSP Tags. **(04 Marks)**

OR

8 a. With a code, explain how to handle HTTP get requests and HTTP post requests. **(09 Marks)**

b. Give step wise explanation to download and Install Tancat. **(07 Marks)**

Module-5

9 a. Write a Java program to open a connection with a database. **(04 Marks)**

b. Mention all the steps to create the association between the database and the JDBC/ODBC bridge. **(12 Marks)**

OR

10 a. Write the Java program to connect to data base using URL and to connect data base using user ID and password. **(08 Marks)**

b. Describe the following concepts

i) Scrollable Result set
ii) Callable statement
iii) Transaction processing
iv) Updatable Result set **(08 Marks)**

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15CS564

Fifth Semester B.E. Degree Examination, Aug./Sept. 2020
Dot Net Framework for Application Development

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Implement general structure of C# program with suitable example. **(06 Marks)**

b. Using expression bodied method, write a C# program to read two arguments as parameter and return output values as addition, substraction, product and division as output parameter from a method. **(06 Marks)**

c. Mention the difference between local scope and class scope with example. **(04 Marks)**

OR

2 a. Discuss the code syntax for the following :
   i) try/catch block
   ii) checked/unchecked
   iii) throw
   iv) finally. **(08 Marks)**

b. Write a C# program to determine the largest of three numbers. **(04 Marks)**

c. List the different types of operators in C#. Explain any one in brief. **(04 Marks)**

Module-2

3 a. What is static method? With an example, illustrate how to declare and call a static method. **(04 Marks)**

b. Give differences between value types and reference types. **(06 Marks)**

c. Explain the use of ref and out parameter with code snippet. **(06 Marks)**

OR

4 a. Explain different ways of copying an array from system. Array class. **(06 Marks)**

b. Differentiate between structure and class. **(05 Marks)**

c. Write a C# program to create an array of person with name and age as fields and display the youngest person in the family by taking age as criteria. **(05 Marks)**

Module-3

5 a. Discuss params array and params objects. **(04 Marks)**

b. Illustrate the concept of method overriding with an example. **(06 Marks)**

c. What is an interface? Describe explicitly implementing an interface with an example. **(06 Marks)**

OR

6 a. Differentiate between abstract class and sealed class. **(05 Marks)**

b. Explain how garbage collector works. **(05 Marks)**

c. Implement the using statement and the IDisposable interface, with an example. **(06 Marks)**

Module-4

7 a. Demonstrate how to declare read only property and write only property for a structure or class. **(06 Marks)**

b. Compare Indexers and arrays. **(04 Marks)**

c. Define indexers in interfaces with an example. **(06 Marks)**

OR

8 a. Examine the issues with object type and the purpose of generics. **(08 Marks)**

b. Explain Queue < T > collection class with an example. **(08 Marks)**

Module-5

9 a. Implement an enumerator by using a simple iterator. **(08 Marks)**

b. What is a delegate? Create an instance of a delegate initialized with a single specific method. **(08 Marks)**

OR

10 a. Explain Ordering, Grouping and aggregating data using LINQ expression. **(08 Marks)**

b. What is operator overloading? Write a program to overload binary operator '+' to add two complex numbers. **(08 Marks)**

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