CBCS SCHEME

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15CS/IS51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Management and Entrepreneurship for IT Industry

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. Define management, Briefly explain the characteristics of management. **(10 Marks)**
   b. Explain levels of management with a neat diagram. **(06 Marks)**

OR

2 a. What is planning, explain the importance of planning. **(08 Marks)**
   b. Explain steps involved in planning. **(08 Marks)**

Module-2

3 a. Discuss the process of selection and recruitment. **(10 Marks)**
   b. Based on the authority what are the different leadership styles explain. **(06 Marks)**

OR

4 a. Explain different motivational theories. **(10 Marks)**
   b. What is communication, explain its importance. **(06 Marks)**

Module-3

5 a. Explain types of entrepreneurship based on innovation and others. **(10 Marks)**
   b. Discuss the role of entrepreneurs in economic development of a country. **(06 Marks)**

OR

6 a. What are the steps involved in identification of business opportunities. **(06 Marks)**
   b. Write a short notes on : i) Market feasibility study
                                 ii) Technical feasibility study. **(10 Marks)**

Module-4

7 a. Explain significance and contents of project report. **(10 Marks)**
   b. Briefly discuss about project identification. **(06 Marks)**

OR

8 a. What is supply management explain with a neat diagram. **(06 Marks)**
   b. Explain steps involved in report writing. **(10 Marks)**

Module-5

9 a. Illustrate steps involved in establishing Micro and Small Scale Industries. **(10 Marks)**
   b. Explain characteristics of small and micro industries. **(06 Marks)**

OR

10 a. Explain MSME–DI and NSIC. **(10 Marks)**
   b. What Intellectual Property Rights explain in detail? **(06 Marks)**

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 the following terms : Reliable Data Transfer , Loss tolerant applications , Bandwidth sensitive applications , Elastic applications. **(08 Marks)**

   b. Explain how recursive queries are resolved in Domain Name System. Illustrate DNS record structure and list any two types of records. **(08 Marks)**

OR

2 a. Discuss Socket Communication between two processes that communicate over Internet with a block diagram. **(08 Marks)**

   b. Explain (HTTP) Hyper Text Transfer Protocol request – response behavior. **(08 Marks)**

Module-2

3 a. Describe why an application developer might choose to run an application over UDP rather than TCP. **(08 Marks)**

   b. Draw finite state machines for both sender side and receiver side of Go – back – N protocol and explain. **(08 Marks)**

OR

4 a. Explain the structure of UDP and illustrate with an example the checksum calculation. **(08 Marks)**

   b. Explain TCP connection management with time line diagrams. **(08 Marks)**

Module-3

5 a. Describe a high level view of a generic router architecture. **(08 Marks)**

   b. Find the least cost path using Link – State Routing Algorithm in the network given in Fig.Q5(b). Assume node 'u' as the source node. Also state the algorithm. **(08 Marks)**
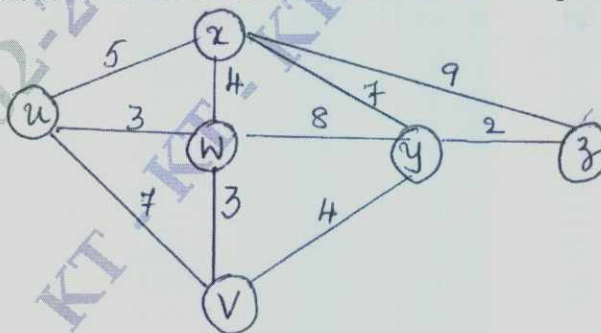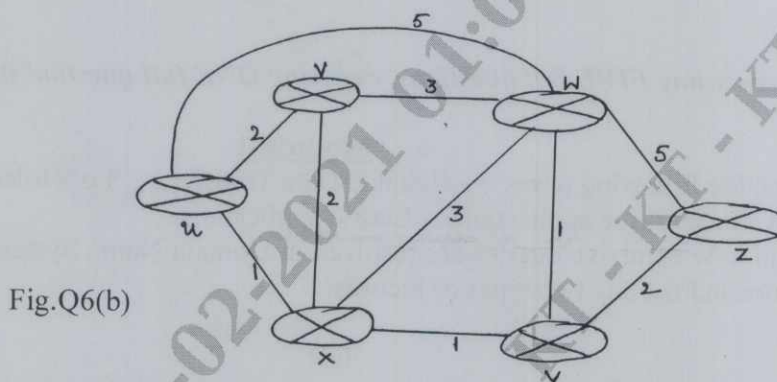
Fig.Q5(b)

OR

6 a. Explain the IPV4 datagram format. (08 Marks)

b. Discuss Distance Vector Routing algorithm. Find the least cost by using Distance Vector algorithm with 'u' as the source node in the network given in Fig. Q6(b). Show the routing table for node 'W'. (08 Marks)

Fig.Q6(b)

Module-4

7 a. Explain 2G Cellular Architecture. (08 Marks)

b. What are the initial elements of a Mobile Network Architecture? Bring out the role of Care – of – address, permanent address and foreign address. (08 Marks)

OR

8 a. Describe how a call is placed to a mobile GSM user in a visited network. (08 Marks)

b. Explain Indirect routing to a mobile node. (08 Marks)

Module-5

9 a. Explain the service requirements and design issues in multimedia network applications. (08 Marks)

b. Explain Streaming of Stored video over HTTP/TCP. (08 Marks)

OR

10 a. What is a Content Distribution Network (CDN)? Explain how DNS is involved in CDN operation. (08 Marks)

b. Explain any two scheduling mechanisms as applicable to networks. (08 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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. What do you mean by Database Management System? Explain the various advantages of using a Database Management System. **(10 Marks)**
   b. Describe the three schema architecture with block diagram. Why do we need mappings between schema levels? **(06 Marks)**

OR

2 a. Explain DBMS component modules along with a neat diagram. **(10 Marks)**
   b. Define Entity , Entity set, Attribute with respect to ER model. List different types of attributes along with their symbols. **(06 Marks)**

Module-2

3 a. Discuss the Entity integrity and Referential integrity constraints. Why is each considered important? **(06 Marks)**
   b. Discuss the following relational algebra operations. Illustrate with an example for each :
      JOIN , DIFFERENCE , SELECT , UNION. **(10 Marks)**

OR

4 a. Give the E.R to relational mapping algorithm. Discuss each step with an example. **(10 Marks)**
   b. Explain the following in SQL :
      i)   Unspecified WHERE – clause and use of the Asterisk.
      ii) Explicit sets and NULLS.
      iii) Renaming attributes and joined tables. **(06 Marks)**

Module-3

5 a. Considered the following relations for a database that keeps track of business trips of sales persons in a sale office.
      SAILORS (SID, SNAME , RATING , AGE)
      BOATS (BID , BNAME, COLOR)
      RESERVES (SID , BID , DAY).
      Specify the following queries in SQL.
      i)   Find the names of sailors who have reserved a red or a green boat.
      ii) Find the names of sailors who are older than the oldest sailors with a rating of 10.
      iii) Find sailors whose rating is better than same sailor called "Ramesh". **(10 Marks)**
   b. How does SQL allow implementation of general integrity constraints? **(06 Marks)**

OR

6 a. Describe the concept of a cursor and how it is used in embedded SQL. **(06 Marks)**
   b. Explain the term stored procedure and give examples why stored procedures are useful. **(05 Marks)**
   c. What are the differences between JDBC and SQLJ? **(05 Marks)**

Module-4

7 a. Explain any two informal quality measures employed for a relational schema design.
(04 Marks)

b. Explain 1NF , 2NF and 3NF with an example for each.
(12 Marks)

OR

8 a. Define Multivalued dependency. Explain 4NF, with an example.
(08 Marks)

b. Define JOIN dependency. Explain 5NF, with an example.
(08 Marks)

Module-5

9 a. Briefly explain the two phase locking protocol used in concurrency control.
(08 Marks)

b. What is Schedule? Illustrate with an example.
(05 Marks)

c. What is Shadow paging scheme? Where it is used?
(03 Marks)

OR

10 a. Discuss the ACID properties of the database transaction.
(04 Marks)

b. What is Time stamping? Explain a mechanism of concurrency control that uses time stamping with the help of an example.
(08 Marks)

c. Write a note on Write ahead log protocol.
(04 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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 terms with example:
         (i) Length of a string   (ii) Reversal   (iii) Proper substring
         (iv) Language   (v) Power of an alphabet   **(05 Marks)**
    b.   Design a FSM to accept set of all strings that either begins or ends or both with substring ab.
                                                                                  (05 Marks)
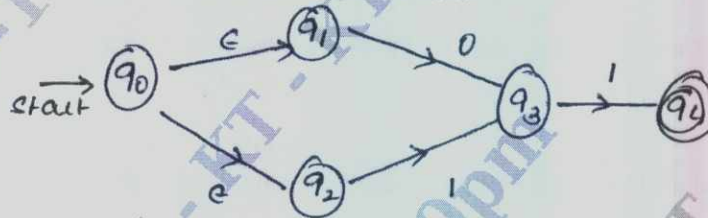   c.   Convert the given NDFSM to DFSM. (Refer Fig.Q1(c))

Fig.Q1(c)   **(06 Marks)**

OR

2   a.   Construct a minimized DFSM for the following: **(08 Marks)**

		*			*			*
↓								
A	B	C	D	E	F	G	H	I
0	B	C	D	E	F	G	H	I	A
1	E	F	H	H	I	B	B	C	E

    b.   Define NDFSM and construct NDFSM for the following languages:
         (i)   To recognize the following set of strings abc, abd and aacd
         (ii) $L = \{w | w \in abab^n$ or aba^n where $n \geq 0\}$
         (iii) $L = \{w | w = aba$ or $|w|$ is even$\}$ **(08 Marks)**

Module-2

3   a.   Define Regular expression. Obtain a regular expression for the following languages:
         (i) $L = \{w : |w|$ is even$\}$
         (ii) $L = \{w :$ in w the 5th character from right is a and either character is b$\}$
         (iii) $L = \{w : w$ contains both aa and aba as sub string$\}$ **(06 Marks)**
    b.   Construct FSM for the following RE:
         (i) ab   (ii) b + (ab)   (iii) (b + (ab))*   (iv) (babb* + a)*   (v) (b + $\in$) (ab)* (a + $\in$)
                                                                                  (10 Marks)

OR

4   a.   Show that for every RE there is an equivalent FSM.   **(05 Marks)**
    b.   Prove that the regular languages are closed under intersection and difference. **(06 Marks)**

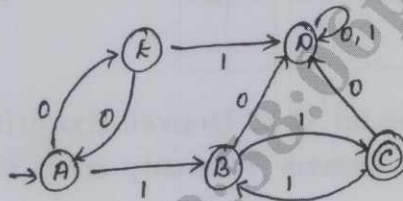c. Obtain RE from the following FSM. (Refer Fig.Q4(c))

Fig.Q4(c) (05 Marks)

Module-3

5 a. Define context free grammar and write CFG for the following languages:
   (i) $L = \{a^i b^j c^k : i + j = k, i \geq 0, j \geq 0\}$
   (ii) $L = \{a^n b^m c^k : n + 2m = k\}$ (06 Marks)

   b. Consider the grammar G, with productions:
   $S \rightarrow AbB$
   $A \rightarrow aA | \in$
   $B \rightarrow aB | bB | \in$
   Give the left most derivation, rightmost derivation and parse tree for the string aaabab. (06 Marks)

   c. What is agbigous grammar? Prove that the following grammar is ambiqous on the string aab.
   G: $S \rightarrow aS | aSbS | \in$ (04 Marks)

OR

6 a. Build a PDA to accept delimiters or balanced paranthesis having paranthesis {, (,) , }. (08 Marks)

   b. Explain the following terms: (i) Pushdown Automata (PDA) (ii) Languages of a PDA (04 Marks)

   c. Obtain a CFG for PDA M with the transitions:
   $\delta(q_0, a, Z) = (q_0, AZ)$
   $\delta(q_0, b, A) = (q_0, AA)$
   $\delta(q_0, a, A) = (q_1, \in)$ (04 Marks)

Module-4

7 a. State and prove pumping Lemma for context free languages. (06 Marks)

   b. Prove that $L = \{w \in \{a, b, c\}^*$ where $n_a(w) = n_b(w) = n_c(w)\}$ is not context free. (04 Marks)

   c. Prove that the Context Free Languages are closed under, union and concatenation. (06 Marks)

OR

8 a. With a neat diagram, explain the working of a basic TM. (06 Marks)

   b. Design a TM to accept the following language $L = \{0^n 1^n 2^n | n \geq 1\}$ (10 Marks)

Module-5

9 Write short notes on:
   a. Multi Tape TM
   b. Non Deterministic TM
   c. Post Correspondence Problem (16 Marks)

OR

10 a. Prove that every Language accepted by a multitape TM is accepted by standard TM with single tape. (06 Marks)

   b. Write note on: (i) Linear Bounded Automata (ii) Recursive Language (10 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Object Oriented Modeling and Design

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 Object Orientation? Explain the concept of OO themes.   (05 Marks)
    b. Explain three kinds of models useful to model a system.   (05 Marks)
    c. Prepare a metadata of CAR model that supports UML concept like class, attribute, association, association with ends and multiplicity.   (06 Marks)

OR

2   a. Explain the following with examples:
        i) links and associations   ii) Aggregation and Association
        iii) Multiplicity   iv) Qualified Association.   (10 Marks)
    b. Prepare a class diagram from the object diagram shown in Fig Q2(b). Explain multiplicity decision.
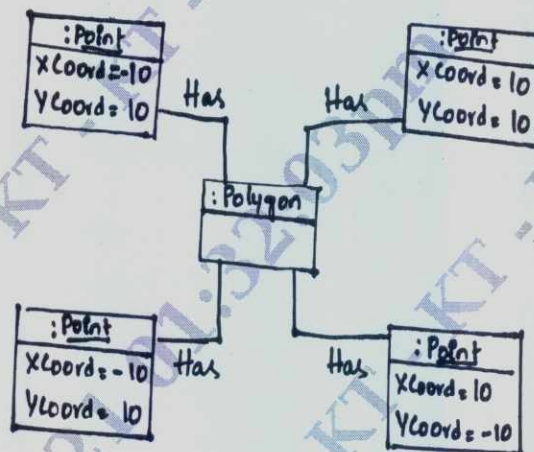

Fig Q2(b)   (06 Marks)

Module-2

3   a. Explain use case diagram with an example.   (05 Marks)
    b. Draw a use case diagram for order –entry subsystem with <<includes>>.   (05 Marks)
    c. Explain Fully developed description used to document a use case.   (06 Marks)

OR

4   a. Explain system sequence diagram notation with example.   (05 Marks)
    b. Explain a simple state chart diagram with example.   (05 Marks)
    c. Draw a second cut state chart for order.   (06 Marks)

Module-3

5   a. Mention the questions to be answered for a good system concept.   (06 Marks)
    b. Explain how unnecessary and incorrect classes can be eliminated.   (06 Marks)
        Explain last step of class modeling (Group classes into packages).   (04 Marks)

OR

6 a. Explain Domain state model. (10 Marks)
   b. Draw a sequence diagram for process transaction scenario. (06 Marks)

Module-4

7 a. With a neat diagram, explain design models with their respective input models. (06 Marks)
   b. Explain standard sterotypes found in design models. (04 Marks)
   c. Explain Cohesion and separation of responsibilities. (06 Marks)

OR

8 a. Draw first cut sequence diagram for lookup item availability use case. (08 Marks)
   b. Explain with an example communication diagram. (08 Marks)

Module-5

9 a. What is a design pattern? Describe design patterns. (08 Marks)
   b. Explain Prototype. (08 Marks)

OR

10 a. Explain how design patterns solve design problems. (08 Marks)
   b. Explain Proxy pattern. (08 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Define with example for each of the following :   (08 Marks)
       i) Autoboxing/unboxing   ii) Type wrapper.
   b. List and explain exceptions and methods of annotations with example. (08 Marks)

OR

2 a. Define Enum. Write a program to display the enumeration constants using values( ) and
       valueOf ( ) method.   (08 Marks)
   b. How Annotations are obtained at runtime by use of reflection.   (08 Marks)

Module-2

3 a. Explain exception and methods that are provided in collection interface. (08 Marks)
   b. List the recent changes made to collection in collection frameworks and explain. (08 Marks)

OR

4 a. Write a program to demonstrate the list interface using ArrayList class. (08 Marks)
   b. What are the exceptions and methods ins Map interface?   (08 Marks)

Module-3

5 a. Explain the different types of string constructors with example.   (08 Marks)
   b. What are the methods to modify a string with example? Explain each.   (08 Marks)

OR

6 a. Explain String Buffer in detail.   (08 Marks)
   b. Define String Handling. Explain special string operations with example. (08 Marks)

Module-4

7 a. Explain the life cycle of Servlets.   (08 Marks)
   b. List and explain the core classes and interfaces that are provided in javax.servlet package
                                                                           (08 Marks)

OR

8 a. What is JSP tag? Explain the different types of JSP tags.   (08 Marks)
   b. What is Cookie? Explain the working of Cookie in JAVA with code snippets. (08 Marks)

Module-5

9 a. Write a program to execute a database transaction.   (08 Marks)
   b. Explain JDBC multifier architecture with neat diagram i.e, driver types? Detail. (08 Marks)

OR

10 a. Describe the various steps of JDBC process with code snippets.   (08 Marks)
   b. Write a note on Database metadata object methods and Resultset metadata object methods.
                                                                           (08 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb.2021
• 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. Explain the general structure of C# program with an example.   **(06 Marks)**
    b. How can C# compiler implicity infer the type of a variable? Explain with suitable examples.   **(06 Marks)**
    c. Explain expression bodied methods with a suitable example.   **(04 Marks)**

OR

2   a. Consider the following code :
```
public void DoWorkWithData(int intData, float, floatData, int moreData)
{
    // some codes
}
```
Suppose it has two more implementations as follows:
```
public void DoWorkWithData (int intData)
{
    // some codes
}
```
and
```
public void DoWorkWithData (int moreData)
{
    // some codes
}
```
This code will fail to compile since it fails to invoke correct overloaded version. How can this issue be solved?   **(08 Marks)**
    b. Explain try, catch, finally and throw keywords with syntax and an example.   **(08 Marks)**

Module-2

3   a. How can you state a class, method and data to be static? Give suitable examples.   **(09 Marks)**
    b. Explain various ways of copying array elements.   **(07 Marks)**

OR

4   a. How does C# facilitate in modifying the original argument passed to a method, when the data it references changes within the method?   **(08 Marks)**
    b. Explain the concept of boxing and unboxing.   **(04 Marks)**
    c. Differentiate between class and structure.   **(04 Marks)**

Module-3

5   a. Write a C# program that has a class TwoDShape with fields dim1 and dim2 and a method area( ). Create a derived class Triangle and Rectangle that inherits TwoDShape. Override method area ( ) to calculate area of Rectangle and Triangle.   **(08 Marks)**
    b. Write a C# program having a method to calculate the sum of a variable number of int arguments passed to it and returing the result as an int.   **(08 Marks)**

OR

6 a. How is multiple inheritance supported in C#? Explain with an example. (08 Marks)
   b. What is the need for garbage collector? How does it work? (08 Marks)

Module-4

7 a. Explain set and get access method with an example. (08 Marks)
   b. Define indexer with an example. Demonstrate with an example. (08 Marks)

OR

8 a. What is the use of generic classes? Write a C# program for swapping :
       (i) Two integers   (ii) Two characters, using generic method. (08 Marks)
   b. Explain Stack<T> collection class with an example. (08 Marks)

Module-5

9 a. Define delegate. How is it declared? Explain with an example. (07 Marks)
   b. Write Language Integrated Query(LINQ) to select, filter and order data. (09 Marks)

OR

10 a. How does ·NET facilitate to define and trap significant actions and arrange for a delegate to be called? (08 Marks)
    b. Write a C# program for overloading + operator. (08 Marks)

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15CS/IS562

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Artificial Intelligence

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 AI technique? Explain in terms of knowledge representation. **(05 Marks)**
  b. Distinguish Breadth-First search and Depth First search. **(06 Marks)**
  c. Write an algorithm for simple Hill climbing. **(05 Marks)**

OR

2 a. On what dimensions problems are analyzed? **(08 Marks)**
  b. Mention issues in design of search problem. **(03 Marks)**
  c. Write a note on constraint satisfaction. **(05 Marks)**

Module-2

3 a. Explain and illustrate unification algorithm. **(06 Marks)**
  b. What are the properties of a good system for the representation of knowledge? **(04 Marks)**
  c. Discuss how forward reasoning is different from backward reasoning. **(06 Marks)**

OR

4 a. With an illustration explain the process of converting well formed formulas to clause form. **(08 Marks)**
  b. Write a note on : i) Conflict resolution   ii) Logic programming. **(08 Marks)**

Module-3

5 a. With an example, explain semantic networks. **(05 Marks)**
  b. What is nonmontonic reasoning? Describe logics for montonic reasoning. **(05 Marks)**
  c. Which are the key issues to be addressed in nonmonotonic reasoning system? **(06 Marks)**

OR

6 a. Desrcribe the implementation issues of nonmontonic reasoning system. **(05 Marks)**
  b. Write a note on Baysean networks. **(05 Marks)**
  c. Explain a simplified frame system with an example. **(06 Marks)**

Module-4

7 a. Why we should build a large knowledge base? **(04 Marks)**
  b. Write the algorithm for MINIMAX. **(08 Marks)**
  c. What is iterative deepening? **(04 Marks)**

OR

8 a. Explain the different dependencies of Conceptual Dependency. **(10 Marks)**
  b. Write a note on Global Ontology. **(06 Marks)**

Module-5

9 a. Enlist and explain different components of natural language understanding process. **(08 Marks)**
  b. How can a program get better without the aid of a teacher? **(08 Marks)**

OR

10 a. Write a note on Analogy. **(05 Marks)**
   b. Which are the capabilities of expert systems? **(04 Marks)**
   c. Distinguish semantic and ease grammers. **(07 Marks)**

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