

CBCS SCHEME

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15CS551

Fifth Semester B.E. Degree Examination, July/August 2021 Object Oriented Modeling and Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. What is object oriented development? Explain. (08 Marks)
b. What is Association class? Explain with neat diagram. (04 Marks)
c. Explain Qualified Association with an example. (04 Marks)
- 2 a. Differentiate between Aggregation and Composition. Explain with an example. (08 Marks)
b. Define Constraints. Explain it with neat diagrams. (08 Marks)
- 3 a. Briefly discuss the detailed object oriented requirements definitions with diagram. (08 Marks)
b. What is Activity Diagram? Draw a activity diagram of the web order scenario with explanation. (08 Marks)
- 4 a. Explain system sequence diagram notation with neat diagram. (08 Marks)
b. What is state chart diagram? Explain nested states and concurrency with an example. (08 Marks)
- 5 a. Briefly discuss the different stages of software development process. (08 Marks)
b. Explain how to prepare a problem statement in software development. (08 Marks)
- 6 What are the steps involved to construct a Domain Class Model? Explain with diagrams. (16 Marks)
- 7 a. Explain object oriented design. The bridge between requirements and implementation with diagram. (08 Marks)
b. Discuss the symbols, notation and design principles of design class diagrams. (08 Marks)
- 8 a. With diagram, explain communication diagrams. (08 Marks)
b. What are the responsibilities of view layer, domain layer and data access layer? Explain with diagram. (08 Marks)
- 9 a. What is design pattern? Explain the four essential elements of pattern. (08 Marks)
b. Briefly discuss how to select design pattern. (08 Marks)
- 10 a. With diagram, explain the object adapter class. (08 Marks)
b. Briefly discuss about prototype pattern. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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15CS52

Fifth Semester B.E. Degree Examination, July/August 2021 Computer Networks

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Explain the general format of an HTTP request message with a neat diagram. (08 Marks)
b. With a neat diagram, explain the architecture of P2P. What are the major challenges of P2P? (08 Marks)
- 2 a. Explain a client server application over TCP using a socket program. (08 Marks)
b. Explain the working of DNS server. (08 Marks)
- 3 a. Why does an application developer would choose to build an application over UDP rather than over TCP? Give reasons. (08 Marks)
b. Discuss the Go-Back-n protocol and compare with selective repeat. (08 Marks)
- 4 a. With a neat diagram, explain the TCP segment structure. (08 Marks)
b. List the TCP congestion control algorithms. Explain any one method with a neat diagram. (08 Marks)
- 5 a. Explain the various switching techniques used in a router. (08 Marks)
b. What are the various approaches used for transition from IPV4 to IPV6? Explain tunneling. (08 Marks)
- 6 a. Explain Dijkstra's algorithm and find the shortest path for the graph given below using Link State algorithm.

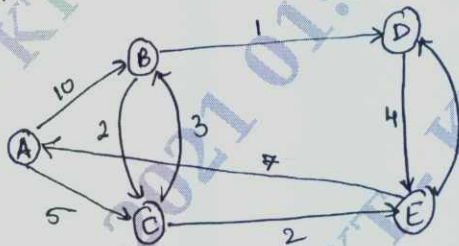


Fig.Q6(a)

- b. How does BGP use the Next-Hop attribute? How does it use the AS-PATH attribute? (08 Marks)
- 7 a. Explain the 3G System Architecture with a neat diagram. (08 Marks)
b. List the approaches used in Routing to a Mobile node. Explain Direct routing to a Mobile Node. (08 Marks)
- 8 a. Discuss the Agent advertisement and mobile IP registration with a neat diagram. (08 Marks)
b. Explain Handoffs in GSM between base stations. (08 Marks)
- 9 Write short notes on:
a. Content Distribution Network (08 Marks)
b. HTTP Streaming (08 Marks)
- 10 a. Write a note on Diffserv architecture. (08 Marks)
b. Discuss Resource Reservation and Call Admission in Multimedia Network. (08 Marks)

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15CS564

Fifth Semester B.E. Degree Examination, July/August 2021 Dot Net Framework for Application Development

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Explain the following:
 - i) Statements
 - ii) Identifiers
 - iii) Keywords
 - iv) Namespace. (08 Marks)
- b. Explain the following: i) Local scope ii) Class scope. (08 Marks)
- 2 a. Write a C# program for adding two numbers using try and catch for the following exceptions:
 - i) Format Exception
 - ii) Overflow Exception. (08 Marks)
- b. Explain checked and unchecked keywords with example. (08 Marks)
- 3 a. Explain partial and anonymous classes with example. (08 Marks)
- b. Explain the use of ref and out parameters. (08 Marks)
- 4 a. List out the difference between structures and classes. (08 Marks)
- b. What is the need for jagged array? Explain with example. (08 Marks)
- 5 a. What is params array? List the rules for using params array with example for each. (08 Marks)
- b. Explain how extension methods are used for a type with example. (08 Marks)
- 6 a. What is interface? List out the restrictions for implementing interfaces. (08 Marks)
- b. What is the need for garbage collector? Explain how dispose method is called from a destructor. (08 Marks)
- 7 a. What are properties? Explain Read-only and Write-only properties. (08 Marks)
- b. What is an indexer? Explain how to implement an interface Indexer in a class (or) structure. (08 Marks)
- 8 a. Explain covariant interface with example. (08 Marks)
- b. What are Collection classes? List all the Collection classes with its description. (08 Marks)
- 9 a. What is iterator? Explain how to implement an enumerator by using a iterator. (08 Marks)
- b. What are delegates? Explain with example how to subscribe an event. (08 Marks)
- 10 a. What is LINQ? Explain with example how to join data held in different Collections. (08 Marks)
- b. Define Operator Overloading. Explain built-in and user-defined conversion operators with example. (08 Marks)

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15CS562

Fifth Semester B.E. Degree Examination, July/August 2021 Artificial Intelligence

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Discuss Program 1 and Program 2 with respect to Tic-Tac-toe game. (08 Marks)
b. A water Jug problem states "You are given two jugs, a 4-gallon one and a 3-gallon one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug?"
(i) Write down the production rules for the above problem.
(ii) Write any one solution to the above problem. (08 Marks)
- 2 a. Explain Depth First Search (DFS) and Breadth First Search (BFS) algorithm. (08 Marks)
b. Explain simple hill climbing and steepest ascent hill climbing algorithm. (08 Marks)
- 3 a. Discuss the various approaches of knowledge representation. (08 Marks)
b. Write well-formed-formulas (wff's) in predicate logic for the given facts:
(i) Marcus was a man.
(ii) Marcus was a Pompeian.
(iii) All Pompeians were Roman.
(iv) Caesar was a ruler.
(v) All Romans were either loyal to Caesar or hated him.
(vi) Everyone is loyal to someone.
(vii) People only try to assassinate rules they are loyal to.
(viii) Marcus tried to assassinate Caesar. (08 Marks)
- 4 a. Write an algorithm to convert well-formed formulas (wff's) into clause form. (08 Marks)
b. Write a short note on procedural knowledge and declarative knowledge. (08 Marks)
- 5 a. Discuss the concept of uncertainty with the help of ABC murder story. (08 Marks)
b. Explain Baye's theorem. (08 Marks)
- 6 a. Write an algorithm for property inheritance. (08 Marks)
b. Apply Baye's theorem for a given problem.
Problem : Marie's marriage is tomorrow.
(i) In recent years, each year it has rained only 5 days.
(ii) The weatherman has predicted rain for tomorrow.
(iii) When it actually rains, the weatherman correctly forecast rain 90% of the time.
(iv) When it doesn't rain, the weatherman incorrectly forecasts rain 10% of the time.
The question : What is the probability that will rain on the day of Marie's wedding? (08 Marks)
- 7 a. Explain Conceptual Dependency (CD). (08 Marks)
b. Explain the components of a script with an example. (08 Marks)
- 8 a. Explain MINMAX search procedure. (08 Marks)
b. Explain alpha-beta cutoffs. (08 Marks)
- 9 a. Explain various steps involved in natural language processing. (08 Marks)
b. Explain candidate elimination algorithm. (08 Marks)
- 10 a. Mention any four major problems with respect to current expert system. (08 Marks)
b. Discuss various learning strategies. (08 Marks)

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15CS/IS53

Fifth Semester B.E. Degree Examination, July/August 2021 Database Management System

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

1. a. Mention the main characteristics of the database approach. (04 Marks)
b. Describe the three-schema architecture with a neat diagram. (04 Marks)
c. With a neat diagram, explain the component module of DBMS. (08 Marks)
2. a. Explain different types of attributes and their notations in ER diagram. (04 Marks)
b. Discuss the concept related to structural constraints of relationship type with suitable example. (04 Marks)
c. Write an ER diagram for a company database. (08 Marks)
3. a. Explain unary relational operators along with their syntax and example. (04 Marks)
b. Consider the following SAILORS database:
SAILORS (Sid, Sname, rating, age)
BOATS (bid, bname, color)
RESERVES (Sid, bid, day)
(i) Find the names of sailors who have reserved green boat.
(ii) Find the names of sailors who have reserved all boats.
(iii) Find the names of sailors who have reserved boat 103. (06 Marks)
c. Explain with example left outer join and right outer join. (06 Marks)
4. a. Explain the steps in mapping from ER to relational schema. Discuss each step with example. (10 Marks)
b. Describe the six clauses in the syntax of SQL retrieval query with example. Which of the six are required and which are optional? (06 Marks)
5. a. Consider the following relation schema:
Works (Pname, Cname, salary)
Lives (pname, street, city)
Located-in (cname, city)
Manager (pname, mgrname)
Write the SQL queries for the following:
(i) Find the names of all persons who live in the city Bangalore.
(ii) Retrieve the names of all person of 'Infosys' whose salary is between Rs.50,000 and Rs.70,000.
(iii) Find the names of all persons who live and work in the same city. (06 Marks)
b. What is a view? Explain how views are created and dropped. (06 Marks)
c. Write a note on aggregate function in SQL. (04 Marks)
6. a. Explain the classification of drivers in JDBC. (04 Marks)
b. What are stored procedures? Explain with example. (06 Marks)
c. Explain the three-tier application architecture. State its advantages. (06 Marks)

- 7 a. Explain update anomalies with example. (04 Marks)
b. Explain when the relational schema is said to be in 1NF. Explain different techniques to achieve 1NF. (06 Marks)
c. With example discuss second normal form and third normal form. (06 Marks)
- 8 a. Write an algorithm to find the closure of X.
If $R = (V, W, X, Y, Z)$
 $FD = \{W \rightarrow XY, Y \rightarrow V, Z \rightarrow V, X \rightarrow Z\}$
Find the key of R. (08 Marks)
b. Consider the relation
 $R = \{ssn, ename, Pnumber, Pname, Ploc, Hrs\}$
 $R_1 = EMP = \{ssn, ename\}$
 $R_2 = PROJ = \{Pnumber, Pname, Ploc\}$
 $R_3 = WORKS_ON = \{ssn, Pnumber, Hrs\}$
 $F = \{ssn \rightarrow ename; Pnumber \rightarrow \{Pname, Ploc\}; \{ssn, Pnumber\} \rightarrow Hrs\}$
Prove that decomposition of R into R_1, R_2 and R_3 is lossless. (08 Marks)
- 9 a. Explain the state transition diagram of a transaction. (04 Marks)
b. Explain two-phase locking techniques for concurrency control. (06 Marks)
c. Explain the following with example:
(i) Serial schedule
(ii) Non-serial schedule
(iii) Conflict serializable schedule (06 Marks)
- 10 a. Explain concurrency control based on timestamp ordering. (06 Marks)
b. Explain the principles used behind ARIES algorithm. (06 Marks)
c. Explain Shadow-paging with example. (04 Marks)
