Paper / Subject Code: 36803 / DISTRIBUTED DATABASES

Q.P. Code: 24228

(3 Hours)   **[Total Marks 80]**

- i. **Q. 1. is Compulsory.**
- ii. **Attempt any three from the remaining.**
- iii. **Assume suitable data.**

Q. 1   **(a)**   What are the characteristics of a Distributed DBMS?   **(5)**

        (b)   What are the benefits of Data Fragmentation in Distributed Database Design?   **(5)**

        (c)   Explain Client server distributed database systems.   **(5)**

        (d)   How is XML useful for data integration?   **(5)**

Q. 2   **(a)**   Describe a simple model for distributed transaction management.   **(10)**

        (b)   Discuss Transparencies in Distributed Database Design.   **(10)**

Q. 3   **(a)**   Explain the different phases of Three-Phase Commit Protocol.   **(10)**

        (b)   Illustrate how a distributed database handles query processing.   **(10)**

Q. 4   Consider a train reservation system. Some information to be stored is given below. (assume any extra information required)   **(20)**
   1. Train information: train id, start station destination station, total number of seats, number of seats reserved, and price of tickets.
   2. Passenger information: passenger-id, name, address, phone number.
   3. Reservation information: passenger-id, train id, date of travel, seat number.

        Design a distributed database solution for three booking stations across the country.

        The Design should include the definition of global schema and fragmentation schema.

Q. 5   **(a)**   What are heterogeneous distributed databases? What are the design issues in such databases?   **(10)**

        (b)   Give the DTD or XML schema for an xml representation of the following nested-relational schema: **(05)**

        Emp = (ename, ChildrenSet setof(Children), SkillSet setof(Skills))

        Children = (name, Birthday) Birthday = (day, month, year)

        Skills = (type, ExamsSet setoff(Exams)) Exams = (year, city).

        (c)   Write a XPath query on the schema of (Q5 b) to list all skill types in Emp.   **(05)**

Q. 6   **(a)**   Write a note on Reference Architecture of Distributed DBMS.   **(10)**

        (b)   Write a note on Concurrency Control in a Distributed Database System.   **(10)**

Q.P code : 36618

(3 Hours) Total Marks:80

N.B : (1) Question No. 1 is compulsory
. (2) Attempt **any three** questions out of remaining five.

1. Answer all questions 20
   (a) What are the objectives of Requirement Analysis?
   (b) What is the significance of configuration items in SCM? List some examples of general SCIs
   (c) Describe the different ways in which a Spiral model is better than Waterfall model
   (d) What is SCRUM? Explain the different roles in SCRUM

2. (a) Explain how an Analysis model is translated to Design models. Explain in detail the design quality guidelines and attributes 10
   (b) What are the benefits of Component-Based Development model? With a neat diagram and explain the different phases of Component Based Development 10

3. (a) Compare the main features and practices at each of the key phases of the agile approach and more traditional approaches of the software development life cycle 10
   (b) Explain Basis Path testing with the following details: Flow graph notations, Cyclomatic complexity and test case derivation. 10

4. (a) Draw the DFD up to Level 2 for a Restaurant Management System which has online food ordering, food delivering, GST calculation, invoice creation, and payments subsystems. 10
   (b) Explain the white box and black box testing methods suiting the above system. (Restaurant management) 10

5. (a) Explain the different Software Quality and Reliability metrics 10
   (b) Describe how version control and change control are carried out during SCM? 10

6. Write short notes on (**any two**) 20
   (a) Risk Management
   (b) Software Maintenance
   (c) Test Driven Development
   (d) User Interface Design considerations

(3 Hours)   **Total Marks: 80**

N.B.: (1) Question No. 1 is compulsory.
     (2) Attempt any three questions out of remaining five questions.

Q1.   (a) Define loader. Explain functions of loader.   (05)
       (b) What are different features of macro?   (05)
       (c) Compare compilers and interpreters.   (05)
       (d) Explain synthesized and inherited attributes.   (05)

Q2.   (a) With reference to assembler, explain the following tables with suitable example.
       (i) POT   (ii) MOT   (iii) ST   (iv) LT   (v) BT   (10)
       (b) Design a predictive parser for the given grammar. Mention all the steps   (10)
          E-> TQ
          T-> FR
          Q-> +TQ|-TQ|E
          R-> *FR|/FR|E
          F-> (E)|id

Q3.   (a) Explain pass 1 of macro processor with flowchart.   (10)
       (b) What is code optimization? What are various strategies for code optimization?   (10)

Q4.   (a) Explain the design of the absolute loader and mention all the data structures   (10)
         in detail.
       (b) What are different types of intermediate code? Explain implementation of three   (10)
         address code.

Q5.   (a) Write a note on Input buffering and also explain role of lexical analyser.   (10)
       (b) Explain various storage allocation strategies.   (10)

Q6.   Write a note on:
       (a) DAG   (05)
       (b) Lex and YACC   (05)
       (c) Syntax directed translation   (05)
       (d) Text editors   (05)

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3 hrs.   **80 marks**

NB:
1. **Question 1 is compulsory**
2. **Attempt any 3 questions out of the remaining questions.**
3. **Assume suitable data whenever required**

Q1)   **Any 4**
   a) Explain the Network and Switching Sub-System of GSM architecture.   **5**

   b) Write short notes on GEO, MEO & LEO   **5**
   c) Enlist the characteristics of SIM.   **5**
   d) Describe Inter MSC handover technique.   **5**

Q 2) **a)** Explain the 4G LTE architecture with a neat diagram.   **10**
          b) Compare and contrast HIPERLANI and HIPERLAN 2.   **10**

Q 3) **a)** What is the disconnection problem? Explain reaction of M-TCP along   **10**
                  with its advantages and disadvantages
          b) GSM maintains end-to-end security by retaining the confidentiality of   **10**
                  calls and anonymity of the GSM subscriber, Justify this statement.

Q4)   **a)** Explain the role of digital signature in mobile security.   **10**
          b) Write a note on Android Framework.   **10**

Q5)   **a)** Draw and explain the architecture of TETRA and specify the standards   **10**
                  and services offered by TETRA
          b) Explain the GPRS architecture in detail. Compare it with GSM   **10**
                  architecture.

Q6)   Write short notes on the following :   **20**
   a) GSM Burst Structure
   b) Agent Advertisement and Discovery
   c) Exposed terminal problem with solution
   d) Co-channel Interference.

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