[Max Marks 80

(3 Hours)

N.B.
(1) Question no. 1 is compulsory.
(2) Attempt any 3 from the remaining questions.
(3) Assume suitable data if necessary.
(4) Figures to right indicate full marks.   5

Q1(a)   Differentiate between Application program and system program.
        Indicate the order in which following system programs are used, from
        developing program upto its execution.   5
        Assemblers , Loaders , Linker , Macro processor , compiler , Editor
Q1(b)   Elliminate Left recursion in the following grammar (Remove Direct
        and Indirect recursion)   5
        S→Aa | b   A → Ac | Sd | ε
Q1(c)   What is an activation record? Draw diagram of General Activation   5
        record and explain the purpose of different fields of an activation record
Q1(d)   What are the different functions of loader.
                                                                            10
Q2(a)   For a given grammar below , construct an operator precedence relation
        matrix , assuming * , + are binary operators and *id* as terminal Symbol
        and E as non-terminal.
             E → E + E   E → E * E   E → id
        Apply operator precedence parsing algorithm for the statement
        id + id * id
                                                                            10
Q2(b)   Explain the role of code optimization in compiler designing ? Explain
        Peephole optimization along with an example.   5
Q3(a)   Write a note on JAVA compiler environment.   5
Q3(b)   Write a brief note on Design of an Editor.   5
Q3(c)   Explain synthesized and Inherited attributes used in Syntax Directed
        Definition.   5
Q3(d)   Find FIRST and FOLLOW Set for given grammar below

        E → T E'   E' → + T E' | ε

        T → F T'   T' → * F T' | ε

        F → (E)   F → *id*
Q4(a)   Explain Design of Dynamic Linking Loader along with example   10
Q4(b)   For the following grammar construct LL(1) parser table   10
        S → F   S → (S – F)   F → a
        And Parse the string (a – a) . Show contents of stack and i/p buffer
        and action taken after each step.
Q5(a)   Explain different pseudo-ops used for conditional macro expansion   10
        along with an example
Q5(b)   What are the different phases of Compiler ? Illustrate compilers internal
        representation of source program for following statement after each   10
        phase
        Position := initial + rate * 60
Q6(a)   With reference to Assembler explain following tables with suitable
        example . (i) POT , (ii) MOT (iii) ST (iv) LT   10
Q6(b)   Explain Backpatching with an example.   10

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MD-Con. 7329-15.

QP Code : 6308

Time: 3 Hrs

Max Marks: 80

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any **three** questions out of remaining **five**.

1. A distance learning institute decides to use e-learning software to ease its regular 20 functioning of the program. Through this e-learning tool students can register to various courses, appear for online exams, download study material, upload assignments online, view lecture videos etc. The faculty can upload study materials, conduct exams, teach one or many courses. The institute can check student and faculty information, collect fees, pay salary, display results and so on. Create an SRS for the institute that includes the following
   1. Product perspective
   2. Scope and objective
   3. Functional requirements (atleast 3)
   4. Non-functional requirements

2 Attempt any four (04).
   (a) Define Software Engineering. Explain in brief the software process framework. 5
   (b) Discuss on Modularity and Functional Independence fundamentals of design concepts. 5
   (c) Explain cyclomatic complexity. How is it computed? 5
   (d) Discuss the different categories of risk that help to define impact values in a risk table. 5
   (e) Briefly explain Unit and Integration Testing in the OO Context. 5

3. (a) Explain in brief the different types of coupling and cohesion. Give one practical example of high cohesion and low coupling 10
   (b) What is FTR in SQA? What are its objectives? Explain the steps in FTR. 10

4. (a) What is Agility in context of software engineering? Explain Extreme Programming (XP) with suitable diagram. 10
   (b) Explain different techniques in White Box Testing. 10

5. (a) Explain the various steps in Risk Management with suitable diagram. Identify the risks associated with delayed projects. 10
   (b) Explain different architectural styles with suitable brief example for each.

6. (a) Explain the change control and version control activities in SCM. 10
   (b) Explain TDD with its advantages. 10

MD-Con.8407-15.

(3 Hours)

N.B. : (1) Question **No. 1 is compulsory**.

(2) Answer any **three** out of the **remaining** questions.

Q 1. [05]

   a) Define Client Server and Peer to Peer distributed system architecture. [05]

   b) Give two applications of XML [05]

   c) What do you mean by serializabilty in a distributed database? [05]

   d) Explain the concept of a "semi-join" using an example.

Q 2. Using a snapshot of the following centralized schema of a database:

    • Departments*(DN, DName, Budget, Location)*

    • Employees*(EN, EName, Title, DNo)*

    • Salary*(Title, Salary)* [05]

   a) Show 2 examples of horizontal fragmentation with fragmentation rules [05]

   b) Show 2 examples of vertical fragmentation with fragmentation rules [05]

   c) Show 2 examples of derived fragmentation with fragmentation rules [05]

   d) Demonstrate the correctness of your fragmentation rules.

Q 3.

(a) Consider a employee management database which maintains entries for employees in a company. Employees may be programmers, managers, designers and testers. Appropriate information is to be maintained for each employee along with their address, salary, etc. (You can make any other reasonable assumptions)

   I. Give the DTD for the XML schema for the described system. [05]

   II. Write the following query in XQuery [05]

   "Find programmers who have worked in projects coding at least two different languages in one year."

(b) Describe query processing in a distributed database. [10]

Q 4.

   (a) Explain the different types of transparencies in a Distributed Database System [10]

   (b) Describe clearly the Three Phase Commit (3PC) algorithm? [10]

Q 5.

   a) Explain two concurrency control algorithms for a distributed database system [10]

   b) What are the issues for query processing in a heterogeneous database? [10]

Q 6. Write Short notes on:

   a) Heterogeneous Database Architecture. [10]

   b) Distributed Deadlock Management. [10]

MD-Con. 9485 -15.

(3 Hours)

[Total Marks: 80]

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b) Give two applications of XML   [05]
c) What do you mean by serializabilty in a distributed database?   [05]
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MD-Con. 9485 -15.