

[This question paper contains 4 printed pages.]

1933

Your Roll No.

B.Sc. (Prog.) / III / NS **E**

CS-302 – SOFTWARE ENGINEERING AND DATABASES

(NC – Admissions of 2005 & onwards)

Time : 3 Hours

Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt all questions.

Parts of a question must be answered together.

SECTION A (Software Engineering)

1. (a) Briefly explain what is “Software Configuration Management” ? Why is a CM process required, in addition to the development process ? (4)
 - (b) What is an SRS ? What is need for SRS ? (4)
 - (c) Explain the difference between the waterfall and iterative models of software development. (4)
 - (d) Discuss the problem of scalability in Software Engineering. How it can be solved ? (4)
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2. Distinguish between **any three** of the following :

(i) Cohesion and Coupling

P.T.O.

- (ii) Transform Module and Coordinate Module in a Structure Chart
 - (iii) Evolutionary and Throwaway Prototype
 - (iv) Verification and Validation of software (6)
3. (a) Give the basic steps of the COCOMO model to estimate the total effort in terms of person months. (4)
- (b) What do you mean by software quality? Explain the various attributes used to assess software quality. (4)
- (c) List 6 common coding standards. (3)
4. Draw a Data-flow diagram for the following narrative :
- Examination in-charge conducts examination in the college. Students who appear for the examination are issued an Admit-card and arrive for the examination according to the date-sheet. Students mark attendance, write answers and handover their copies to the invigilator. Identify the different processes and data stores. (4)

SECTION B (Databases)

5. (a) Define a database system. List the components of a database system. (4)

- (b) What is the purpose of internal level, conceptual level, and external level in 3-tier database architecture? Explain. (4)
6. Distinguish between any 3 of the following :
- (i) Logical and Physical data independence
 - (ii) Primary key and foreign key
 - (iii) Composite and Multivalued attribute
 - (iv) File-oriented and Database approach (6)
7. (a) Discuss insertion, deletion, update anomalies. Why are they considered bad? Illustrate with examples. (4)
- (b) What is normalization? Why is it required? (4)
- (c) Consider a relation $R(A, C, D, E)$ with the following FDs
- $$AB \rightarrow C, CD \rightarrow E, DE \rightarrow B$$
- Is AB a candidate key of this relation? If not, is ABD? Explain your answer. (4)
8. A company database needs to store information about employees (identified by *Ssn*, with *salary* and *phone* as attribute), departments (identified by *Dno*, with *dname* and *budget* as attributes), and children of employees (with *name* and *age* as attributes). Employees work in departments; each department is managed by an employee; a child must be uniquely

identified by *name* when the parent (who is an employee; assume only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. Draw an E-R diagram that captures this information. (4)

(a) For the given schema :

CUSTOMER(cust-no, name, cust-city)
ORDER(order-no, odate, cust-no, ord-amt)
ORDER_ITEM(order-no, item-no, qty)
ITEM(item-no, unit-price)
WAREHOUSE(warehouse-no, city)
SHIPMENT(order-no, warehouse-no, ship-date)

Write SQL statements to achieve **any four** of the following :

- (i) Write a create table statement for the relation CUSTOMER.
 - (ii) Insert a new tuple in the ORDER relation. Assume your own data.
 - (iii) Retrieve a list of order-no and ship-date for all orders shipped from warehouse no. W5.
- (b) Retrieve the warehouse information from which the customer named 'Ronn' was supplied his orders. Produce a listing order-no, warehouse-no.
- Retrieve the details of all the orders for orders shipped from warehouse in 'Denver'. (8)