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No. of Printed Pages—3 **IT-502/CS-701**

B. TECH.

FIFTH/SEVENTH SEMESTER EXAMINATION, 2003-2004

SOFTWARE ENGINEERING

Time : 3 Hours *Total Marks : 100*

Note : (1) Attempt **ALL** questions.

(2) Every question carries **20** marks.

(3) Make suitable assumptions wherever needed.

1. Attempt any *FOUR* of the following :— **(5×4=20)**

(a) Discuss evolution of Software Engineering and give key challenges that Software Engineering faces today.

(b) Give components of a software. Discuss how software is different from a program.

(c) Write down major characteristics of a software. Illustrate with a diagram that the software doesn't wear-out.

(d) Discuss major areas of applications of the software.

(e) Briefly discuss various phases of software development life-cycle.

(f) What are the main problems associated with software development and their underlying causes ?

2. Attempt any *FOUR* of the following :— **(5×4=20)**

(a) Discuss the prototyping model and its relative advantages and disadvantages.

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(b) A Fourth Generation Tool (4 GT) normally encompasses a broad array of tools. Give a comprehensive list of such tools.

(c) How is a SRS document organised into different sections ?

(d) Give Halestead's software science measures for :

(i) Program Length,

(ii) Program Volume,

(iii) Program Level,

(iv) Efforts,

(v) Language Level.

(e) Discuss different types of coupling and cohesion measures of modules.

(f) Briefly illustrate features of function-oriented and object-oriented designs.

3. Attempt any *TWO* of the following :— (10×2=20)

(a) Consider the following procedure for GCD computation :—

```
int gcd (x, y)
    int x, y;
{
    while (x ! = y)
    {       if (x > y)
            x = x – y;
            else y = y – x;
    }
    return(x)
}
```

Draw a Control Flow Graph (CFG) for the procedure and find out cyclomatic complexity and independent paths.

(b) Briefly discuss the following :—

(i) White Box Testing

(ii) Test Case Design

(iii) Reliability Assessment Models

(ii) Verification and Validation

(c) Give general features of Top down and Bottom up structured programming languages. Also list out some coding standards.

4. Attempt any *TWO* of the following :— **(10×2=20)**

(a) Give a list of major project estimation techniques and discuss COCOMO model in detail.

(b) Write short notes on the following :—

(i) Statistical Quality Assurance

(ii) Risk Management

(c) Briefly discuss the following :—

(i) Object-Oriented Design Methodology

(ii) Data Flow Diagrams

5. Attempt any *TWO* of the following :— **(10×2=20)**

(a) How do you define Reliability ? Discuss various models for reliability allocation.

(b) Discuss main requirements of ISO 9001 and compare it with SEI capability maturity model.

(c) Give architecture of a CASE environment. How does CASE assist in software life-cycle ?