THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY

Computer Science & Engineering Department

B.E. Computer Engineering Final Year, End Semester Exam

Subject: Software Engineering — Instructor : Rajesh K. Bhatia
Code : CS 011 — Date : 13.12.06
Time : 3 Hour — M. Marks : 90

NOTE: Attempt all questions. All questions carry equal marks.

1.a) What is a software process? What are the constituents of software process? How Capability Maturity Model (SEI-CMM) helps to improve the software process. 9

b) What is software measurement? Why do we need to measure software? How should we select a software metric? 9

2.a) Using your knowledge of how a university system works, develop a set of use cases that could serve as a basis for understanding the requirements for a university system. 9

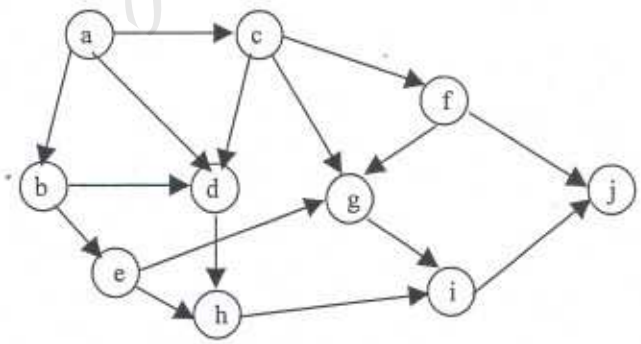
b) Discuss the problem of using natural language for defining user and system requirements, and show, using small example(s), how formal methods can help to overcome these problems. 9

3.a) What do you mean by exhaustive testing? Explain with the help of suitable example why exhaustive testing is not feasible even for a very small system. 9

b) The following project started on January 1 and should be finished by June 1. It is now March 1 Determine whether the project is on time. Also comment on the cost of the project. Justify your answer. 9

Job Id	Estimated Time	Actual Time Spent	Due Date	Completed
1	30	10	February 1	-
2	20	30	March 1	Yes
3	50	30	May 1	Yes
4	100	5	June 1	

4.a) Calculate McCabe's cyclomatic complexity from the following control flow graph only with predicate node method: 5



b) If the software had 5 failures in 100 tests during 10 days of testing, what would be a good estimate of the reliability of the software over the next day? Over the next Week? 5

c) Draw the control flow graph and determine the McCabe's cyclomatic complexity for the following code also mark the node numbers in the code: 8

```
cin>> a >> b >> c;
if (a > 10)
{       cout<< "hello";
        if (b < a)
          {
                    cout << "part 1";
                     if (c > a)
                       {     cout << "part 2";
                         }
          }
         else
         {
            cout << "part 3";
          }
}
cout << "exiting";
```

5. Discuss the following with suitable example:
   a) Analysis of Real-Time software 9
   b) Unified Modeling Language 9