#### Reg. No.



A Courtraew Instantion of Manipal University

MANIPAL INSTITUTE OF TECHNOLOGY

# V SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)

### END SEMESTER MAKE UP EXAMINATIONS, November/December 2017

# SUBJECT: Software Engineering [CSE 3104]

#### REVISED CREDIT SYSTEM (23/12/2017)

Time: 3 Hours

MAX. MARKS: 50

### Instructions to Candidates:

- \* Answer ALL FIVE questions.
- ✤ Missing data may be suitable assumed.
- 1A. What is Software Engineering as per IEEE standards? Justify it as a science or an art.
- **1B.** (i) Explain the differences between life cycle models relevant for finding out errors during phases and for calculating risks during phases.

(ii) If five clients are connected to server , for storing data in a database, which is the most suitable software life cycle model to be used?

5M

**1C.** What do you mean by anomaly, inconsistency and incompleteness of requirements? Explain with an example.

3M

2A. Given a FIFO queue, having maximum size, 'max' and which supports operations like create, append, remove, first and isempty. All operations mentioned above have usual meaning. Underflow, Overflow and no value (null) have to be taken care. Give Algebraic Specification for the above problem.

3M

2B. Case Study 1: Judiciary Information System (JIS) - The attorney general's office wants to develop a Judiciary Information System (JIS), to help handle court cases and also to make the past court cases easily accessible to the lawyers and judges. For each court case, the name of the defendant, defendant's address, the crime type (ex: theft, arson, etc), when committed (date), where committed (location), name of the arresting officer, and the date of the arrest are entered by the court register. Each court case is identified by a unique case identification number (CIN) which is generated by the computer. The registrar assigns a date of hearing for each case. For this the registrar expects the computer to display the vacant slots on any working day during which the case can be scheduled. Each time a case is adjourned, the reason for adjournment is entered by the registrar and he assigns a new hearing date. If hearing takes place on any day for a case, the registrar enters the summary of the court proceedings and assigns a new hearing date. Also on completion of a court case, the summary of the judgment is recorded and the case is closed but the details of the case are maintained for future reference. Other data maintained about a case include the name of the presiding judge, the public prosecutor, the starting date, and the expected completion date of trial. The judges should be able to browse through the old cases for guidance on their judgment. The lawers should also be permitted to browse old cases, but should be charged for each old case they browse. Using the JIS software, the Registrar of the court should be able to query the following:

(a) The currently pending court case: In response to this query, the computer should print out the pending cases sorted by CIN. For each pending case, the following data should be listed: the date on which the case started, the defendant's name, address, crime details, the lawyer's name, the public prosecutor's name, and the attending judge's name.

(b) The cases that have been resolved over any given period: The output in this case should chronologically list the starting date of the case, the CIN, the date on which the judgment was delivered, the name of the attending judge, and the judgment summary.

- (c) The cases that are coming up for hearing on a particular date.
- (d) The status of any particular case. (cases are identified by CIN).

Give Structured Analysis and Structured Design for the above problem.

5M

- **2C.** What are characteristics of a good design? Explain. **2M**
- **3A.** Enlisting all the use cases, give a complete Use Case diagram for Case Study 1.
- **3B.** Suppose, size of an organic product is 18000 LOC. Also if average salary of software developers is Rs. 17000 per month, determine effort, nominal development time and cost to develop the project.

3M

2M

- **3C.** What are the steps for Scheduling a software project? Explain with an example.
- 4A. What are the different system views that can be modeled using UML? What are the different UML diagrams which can be used to capture each of these views? Do we need to develop all views of a system using all modeling diagrams supported by UML? Justify your answer with diagram. 3M

```
4C. While (num > 0)
```

```
fact =fact * num;
num=num-1;
```

```
}
```

```
return (fact);
```

(i) Perform Path Coverage using Control Flow Graph for the above problem. (ii) What do you mean by linearly independent paths in general ? Do you get linearly independent paths in the above problem?

4M

5M

3M

5A. (i) How are UML relationships viewed in Use Case diagrams and Class Diagrams? Explain.

(ii) Draw an activity diagram for Student Admission procedure, where in, the student deals with his or her academic records, paying tuition fees, joining hostel, becoming a member of a hospital and registering for courses in a 4M department. 2M

- **5B.** What are the different types of Code Review? Explain.
- **5C.** (i) What is Unit Testing? Explain with a diagram.

(ii) Perform a Black Box Test for squaring an integer between 0 and 250. Give all steps involved.

4M