MANIPAL UNIVERSITY
JAIPUR

School of Computing & IT
V Semester B. Tech End Semester Examination **DEC 2016**
Course Code & Course Name
QUESTION PAPER
OPEN BOOK EXAMINATION

Duration:3hrs **Max Marks: 100**

Note: Attempt any 5 questions.
Any missing or misprinted data may be assumed suitably.

Q.1 (i) Describe at least one scenario where:

(a)RAD model would be applicable and not the waterfall model.

(b) Waterfall model is preferable than all other models

Explain above with reasons [5+5]

(ii) How does the Spiral model overcome the limitation of the waterfall cycle model and the V-shaped cycle model? Which model is suitable for large-scale and mission critical applications and why? [10]

Q.2 (i) An independent truck company wants to track and record its driver driving habits. For this purpose company has rented 800 phone numbers and has printed the numbers on the front, back and side of all trucks owned by the company. Next to the numbers a message is written "PLEASE REPORT ANY DRIVER OR TRUCK PROBLEM BY CALLING THIS NUMBER" The company waits for you to develop a system that:

[15]

a. Collects information from caller about the driver performance and behavior as well as truck condition

b. Generates daily and monthly reports for each driver and truck management

c. Report problems that require immediate action of an on-duty manager. Analyze the problem statement to be incorporated with the SRS document.

(ii) Explain the above scenario (in Q2 i) using an Activity Diagram.
[5]

Q.3 (i) Why testing is an important phase of SDLC, explain with suitable example. Difference between testing and debugging. Which testing is more appropriate after the development of user

interface and why? When should be testing stopped, explain with example.
[10]

(ii) Test cases for the application whose input box accepts numbers between 1-1000. Valid range 1-1000, Invalid range 0 or below and invalid range 1001 or more.
[10]

Write Test Cases for Valid partition value, Invalid partition value and exact boundary value.

•Test Cases 1: Consider test data exactly as the input boundaries of input domain i.e. values 1 and 1000.

•Test Cases 2: Consider test data with values just below the extreme edges of input domains i.e. values 0 and 999.

•Test Cases 3: Consider test data with values just above the extreme edges of input domain i.e. values 2 and 1001.

Q.4 (i) Given AMS of Manipal University, draw upto level-2 DFD diagram.
[10]

(ii) Compute function point value for a project with the following domain Characteristics:
[10]

No. of I/P = 40

No. of O/P = 60

No. of user Inquiries = 29

No. of files = 10

No. of external interfaces = 4

Assume that all the complexity adjustment values are average. Calculate VAF and FP.

Q.5 (i) Draw use case diagram for below problem and identify functional and non-functional requirements

At the beginning of each semester students may request a course catalogue containing a list of course offerings for the semester. Information about each course, such as professor, department, and prerequisites will be included to help students make informed decisions.

The new on-line registration system will allow students to select four course offerings for the coming semester. In addition, each student will indicate two alternative choices in case a course offering becomes filled or canceled. No course offering will have more than ten students. No course offering will have fewer than three students. A course offering with fewer than three students will be canceled. Once the registration process is completed for a student, the registration system sends information to the billing system, so the student can be billed for the semester.

Professors must be able to access the on-line system to indicate which courses they will be teaching. They will also need to see which students signed up for their course offering.

For each semester, there is a period of time that students can change their schedules. Students must be able to access the on-line system during this time to add or drop courses. The billing system will credit all students for courses dropped during this period of time.

[10]

(ii) Consider the program given below

```
1. void main()
2. {
3. int i,j,k;
4. readln (i,j,k);
5. if( (i < j) || ( i > k) )
6. {
7. writeln("then part");
8. if (j < k)
9. writeln ("j less then k");
10. else writeln ( " j not less then k");
11. }
12. else writeln( "else Part"); }
```

(a) Draw the control flow graph for the above code.
[3]

(b) Draw the DD graph
[3]

(c) Determine the cyclomatic complexity. [2]

(d) Determine the predicate (π) nodes of DD graph. [1]

(e) Determine all the independent paths. [1]

Q.6 i(a) Create a decision table for the following program in an office email system

- Send email when Recipient address present, subject present, before 5:30pm
- If after 5:30pm then put in pending folder

If Recipient address missing or subject message, give warning message
[5]

i(b) An email management decision tree might begin with a box labeled "Receive new message." From that, one branch leading off might lead to "Requires immediate response." From there, a "Yes" box leads to a single decision: "Respond." A "No" box leads to "Will take less than three minutes to answer" or "Will take more than three minutes to answer." From the first box, a box leads to "Respond" and from the second box, a branch leads to "Mark as task and assign

priority." The branches might converge after that to "Email responded to? File or dele message."[5]

(ii) Calculate Length , Vocabulary, Volume , Difficulty, Time should be required for the following program.

[10]

```
int main()
{
   int year;

   printf("Enter a year: ");
   scanf("%d",&year);

   if(year%4 == 0)
   {
      if( year%100 == 0)
      {
         if ( year%400 == 0)
            printf("%d is a leap year.", year);
         else
            printf("%d is not a leap year.", year);
      }
      else
         printf("%d is a leap year.", year );
   }
   else
      printf("%d is not a leap year.", year);

   return 0;
}
```