(Please write your Exam Roll No.) **Exam Roll No. ……**

END TERM EXAMINATION

THIRD SEMESTER [MCA] DECEMBER-2010

Paper Code: MCA209 **Subject: Software Engineering**
Paper Id-44209

Time : 3 Hours **Maximum Marks :60**

Note : Q.No.1 is compulsory. Internal choice is indicated.

Q.1. Attempt ALL questions: (5x4=20)

(a) What do you understand by software crisis? What are its symptoms and causes? What are its remedies?
(b) What do you understand by a software development process? What problems might occur if a software development organization does not use any specific development process?
(c) What are the various types of functional testing techniques? Discuss any one in detail.
(d) Is it possible to estimate software size before coding? Justify your answer with suitable examples?
(e) Explain the significance of software reliability engineering.

Q.2. (a) Discuss the Prototyping model. What is the effect of designing a prototype on the overall cost of the project? (10)

(b) What are the characteristics of a good software requirement specification (SRS) document?

OR

Q.2. Consider the following Transport Company Automation (TCA) software. A transport company requires to automate its various operations. The company has fleet of vehicles. Currently the company has the following vehicles:

Ambassadors	:10 Non-AC, 2 AC
Tata Sumo	:5 Non-AC, 5 AC
Maruti Omni	:10 Non-AC
Maruti Esteem	:10 AC
Mahindra Armada	:10 Non-AC

P.T.O.

The company rents out vehicles to customers. When a customer requests for a car, the company lets them know what types of vehicles are available and the charges for each car.

For every car, there is per hour charge and a per kilometre charge. A car can be rented for a minimum of 4 hours. The amount chargeable to a customer is maximum of (per hour charge for the car times the number of hours used, and per kilometre charge times the number of kilometres run) subject to a minimum amount decided by the charge for 4 hours use of the car.

An AC vehicle of a particular category is charged 50% more than a non-AC vehicle of the same category.

There is a charge of rupees 150 for every night halt regardless of the type of the vehicle.

When a customer books a car, he has to deposit an advance amount. The customer also informs the company when he expects to return the car. When the car is returned, depending on the usage, either the customer is refunded some amount, or he has to pay additional amount to cover the cost incurred.

In addition to automating the above activities, the company wants to collect statistics about various types of vehicles such as average amount of money spent on repairs for the car, average demand, revenue earned by renting out the car, and fuel consumption of the car. Based on these statistics, the company may take a decision about which vehicles are more profitable. The statistics can also be used to decide the charge for different types of vehicles.

Draw the following using standard notations. If necessary you can make suitable assumptions regarding the details of various features of TCA software, but you must clearly write down the assumptions you make.

(1) Draw the context diagram (level 0 DFD) for the TCA software.(3)
(2) Draw the level 1 DFD for the TCA software. (4)
(3) Draw Usecase diagram for the TCA software. (3)

Q.3. (a) Explain all the levels of COCOMO model. Assume that the size of an organic software product has been estimated to be 32,000 lines of code. Determine the effort to develop the software product and the nominal development time. (10)

(b) What is risk? Is it economical to do risk management? What is the effect of this activity on overall cost of the project?

OR

Q.3. (a) Why should a software analyst prefer Object Oriented Analysis of Information Systems to the traditional methods of analysing such systems?

(b) Define Module Cohesion and explain various types of Cohesion?

Q.4. (a) What are the various key process areas at defined level in CMM? Describe activities associated with one key process area. (10)

(b) What are Software Metrics? Describe Data Structure Metrics.

OR

Q.4. (a) Describe the McCall software quality model. How many product quality factors are defined end why?

(b) What are Information flow Metrics? Explain the basic information flow model.

Q.5. Consider the following program segment.

```
1.  void sort (int a[],int n){
2.  int i,j;
3.  for(i=0;i<n;i++)
4.    for(j=i+1;j,n;j++)
5.          if(a[i]>a[j])
6.          {
7.          temp=a[i];
8.          a[i]=a[j];
9.          a[j]=temp;
10.         }
11. }
```

(a) Draw the control flow graph for this program segment. (4)
(b) Determine the cyclomatic complexity for this program. (3)
(c) How is cyclomatic complexity metric useful during software development? (3)

OR

Q.5. (a) What are the five Software Configuration Management(SCM) tasks? Define and discuss each of them briefly. (5)

(b) Write a shirt note on Boledy and Lehman model for calculation of maintenance effort. (5)
