Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FIFTH SEMESTER B.Tech (CCE) DEGREE MAKE-UP EXAMINATION JAN 2016

SUBJECT: SOFTWARE DESIGN TECHNOLOGY– ICT 359

(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **06/1/2016** **MAX. MARKS: 50**

Instructions to candidates

- Answer any **FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. With a neat diagram, explain SCRUM agile process model. Mention its advantages and disadvantages.

1B. Define Software Process and explain generic process model with the diagram.

1C. Differentiate state and event with respect to state transition diagrams. List different types of events. [5+3+2]

2A. The system should supports chain of hotels. A hotel contains two categories of rooms: executive and normal, both AC and non-AC. The customers of executive rooms can avail extra facilities like games, swimming, food service in rooms, etc. The booking is possible by internet or by phone. If the booking is through phone, process is done by receptionist, and if booking is done through internet the process is carried out by customer through hotel website. Depending on the number of days customer stays, appropriate bill is generated. The bill also contains amount for transport, food and other facilities enjoyed by the customer along with necessary taxes. The manager should be able to generate reports like list of customers staying in the hotel, list of rooms empty, monthly/yearly income, etc. Draw the use-case diagram for the above problem statement and write use case specifications for any two use cases.

2B. Explain the types of Risks and also emphasize on the different risk strategies.

2C. State the importance of Negotiation task in Requirement Engineering. [5+3+2]

3A. Identify the classes and draw the class diagram with all relationships and appropriate multiplicities for following problem statement.
Supermarket requires stock control system to void out of stock level for each product. A purchasing_admin will be able to process an order by entering product numbers and required quantities into the system. The system will display a description, price and available stock. In-stock products will normally be collected immediately by the customer from the store. If stock is not available the purchasing_admin will be able to create a backorder for the product. The system will allow products to be paid by cash. Order details for in-stock products will be printed including the quantity, product number and description. The store manager will be able at any time to print a summary report of sales in the store for a given period, including assignment of sales to sales assistants in order to calculate weekly sales. The stock manager will be able to monitor stock levels and weekly run-rates in order to set minimum stock levels and requisition products which fall below the minimum stock levels or for which demand is anticipated. When the stock arrives it will be booked in by the warehouse person. Stock that has been backordered for collection from the store is held in a separate area and the store manager advised of its arrival. The catalogue of available products will be maintained remotely.

3B. With respect to project scheduling explain the need of the following:
i. Activity network ii. Slack time iii. Gantt

3C. What do you mean by Aggregation? Bring out the difference between Aggregation and Composition with a suitable example. [5+3+2]

4A. Identify states and events for a Photocopier (xerox) machine from the description given below and draw the state diagram for the same.
Initially the machine is off. When the operator switches on the machine, it first warms up during which it performs some internal tests. Once the tests are over, machine is ready for making copies. When operator loads a page to be photocopied and press 'start' button, machine starts making copies according to the number of copies selected. While machine is making copies, machine may go out of paper. Once operator loads sufficient pages, it can start making copies again. During the photocopy process, if paper jam occurs in the machine, operator may need to clean the path by removing the jammed paper to make the machine ready.

4B. Define the purpose of following terms with suitable example and UML notations.
i. Association Class ii. Synchronous Message iii. Fork and join

4C. "As the number of modules grows the effort and cost associated with integrating the modules also grows." Justify the statement with suitable diagram. [5+3+2]

5A. Consider the following pseudo code:

```
int i, first, second;
first = second = INT_MAX;
 for (i = 0; i < arr_size ; i ++)
 {
   /* If current element is smaller than first then update both
    first and second */
   if (arr[i] < first)
   {
     second = first;
     first = arr[i];
   }
   /* If arr[i] is in between first and second then update second  */
   else if (arr[i] < second && arr[i] != first)
     second = arr[i];
 }
 if (second == INT_MAX)
   printf("There is no second smallest element\n");
 else
      printf("The smallest element is %d and second Smallest element
   %d\n",  first, second);
```

i. Draw the CFG for the pseudocode.
ii. Find the cyclomatic complexity for the CFG in terms of regions, edges and predicate nodes
iii. Find the independent execution paths.
iv. Write the test cases for the identified independent paths.

5B. Draw the Activity diagram for the following problem statement.
SAM'S Couriers Limited intends to computerize recruitment process. The advertisements for particular post appear on their website. The candidates are called for interview based on eligibility criteria which varies from post to post information regarding the eligibility and vacancies is maintained in database. The candidate is selected based on written test and interview. Once selected the candidate is under probation for one year. In this period the candidate is not eligible for any special leaves and benefits. After completion of probation period the manager evaluates the candidate performance and will be given an appointment letter with a unique employee id.

5C. Why Baseline is important in Software Configuration Management? Explain with suitable example. [5+3+2]

6A. Explain the following concepts emphasizing of their use and need with relevant example
i. Coupling and Cohesion ii. Equivalence partitioning iii. Earned Value Analysis

6B. Assume that the size of a semi-detached type software product has been estimated to be 52,000 lines of source code. Assume that the average salary of software engineers be Rs. 20,000/- per month. Determine the effort required to develop the software product and the nominal development time using COCOMO model II and calculate the final cost required for software.

6C. Compare and contrast alpha and beta Testing. [5+3+2]

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