Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Unit of MAHE, Manipal

FIRST SEMESTER M.TECH. (SOFTWARE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV 2018

SUBJECT: SOFTWARE DESIGN [ICT 5123]

(REVISED CREDIT SYSTEM)
(24/11/2018)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates:
- Answer **ALL** questions.
- Missing data, if any, may be suitably assumed.

1A. With neat diagrams explain different agile process models. **(05)**

1B. Write the swimlane diagram for the voting system described below:
Once arrived at the polling station, elector gives his/her electoral card to the station president who checks if the polling station number in the electoral card is correct. Then station president checks the identity document and if OK he gives the ballot paper to the elector. Then the president waits for a voting cabin to get free and he gives the pencil to the elector. Before voting, the secretory gets the signature of the elector on the registry and puts a stamp on the elector certificate. Once elector has voted he/she inserts the ballot paper in the urn, giving back the pencil and taking back the id document. **(03)**

1C. Which life cycle model will you follow for developing an extremely large software that would provide, monitor and control, cellular communication among its subscribers using a set of revolving satellites? Justify your answer. **(02)**

2A. Consider an inventory system which is a real time application used in the merchant's day to day system. This is a database to store the transaction that takes places between the manufacturer, dealer and the shop keeper that includes stock inward and stock outward with reference to the dealer. Assume your self as the dealer and proceed with the transaction as follows: The manufacturer is the producer of the items and it contains the necessary information of the item such as price per item, date of manufacture, best before use, number of item available and their company address. The dealer is the secondary source of an item and he purchases Item from the manufacturer by requesting the required item with its corresponding company name and the number of items required. The dealer is only responsible for distribution of the item to the retailers in the town or city. The shop keeper or retailer is the one who is prime source for selling items in the market. The customers get item from the shop keeper and not directly from the manufacturer or the dealer. The stock is the database used in our system which records all transactions that takes place between the manufacturer and the dealer and the dealer and the retailer.

Draw the use case and sequence diagram for the above given problem statement in Q2A. **(05)**

2B. Explain the steps involved in the interface design along with the golden rules. (03)

2C. "Software does not wear out". Justify this statement (02)

3A. Suppose you have a Bird interface with fly() and makeSound() methods and a ToyDuck interface with squeak() method. Sparrow is a concrete class of Bird class and PlasticToyDuck is the concrete class for ToyDuck Class. Assume that you are short on ToyDuck objects and you would like to use Bird objects in their place. Birds have some similar functionality but implement a different interface, so you cannot use them directly.
Identify and explain the suitable design pattern to implement the above scenario. (05)

3B. Explain the following:
i.) Data Design Element ii.) Component Design Element (03)

3C. Explain the methods involved in requirements elicitation process. (02)

4A. Previously people wishing to visit places had to manually search for available accommodation at the visiting places. Also they themselves had to make reservation. People hardly had any knowledge of which are the worth seeing places and about its history. Such procedure was time consuming and energy wasting. Tour Reservation System has made life very easy for such visitors by saving both their time and energy. Visitor requests for scheme to check the availability of the desired tour package. This information is stored in Tour Information System. System will check whether the customer is existing or new. New user will enter his personal and tour details for reservation. In turn he/she will be provided with system generated unique ID and password. This login information could be used for further transactions. When customer is satisfied with tour package he/she would request for reservation of tour. Personal details of new customer is stored in cust_info while the details regarding the tour selected by particular customer is stored in tour_info and the details regarding it would be restructured in Tour Information System. Existing customer can update his/her personal details in cust_info and cancel reservation for tour from tour_info and changes regarding it are also reflected in Tour Information System. After confirming the tour package the customer will make payment either online or through staff by personally going at the office. Customer can make payment by cash, credit card or by cheque. System checks for the validity of staff. Once the payment is done by customer, valid staff will make Ticket Reservation System. Reserved customer will be able to view details about reservation by providing login information from cust_info and tour_info system. Administrator can add, delete or modify tour schemes from Tour Information System.
For the Tour Information System described above in Q4A draw the class diagram by properly identifying the attributes, operations, multiplicity, relationships and rolenames using noun phrase approach. (05)

4B. Using the example of a retail clothing store in a mall, list the relevant data flows, data stores, processes and sources/sinks. Draw a context and the level-1 data flow diagram that represent the selling system at the store. (03)

4C. Explain the steps involved in Inception task of requirements engineering. (02)

5A. What are the guidelines to be followed to achieve design quality? Also, explain the different attributes needed to achieve the design quality. **(05)**

5B. The client and server are the two modules, where server will produce the services requested by the client. Initially the server will be in the listen mode. Being in the listen mode the server may get a client's IP address. The server validates the IP address sent by the client. The server will be in the accepted stage and wait for the filename which wants to be downloaded. On receiving a filename, server starts downloading. The size of file is 50Mbs. Due to the technical problem the server may be down after successful download of 30Mbs so that downloading of a file will be stopped else download will continue till the end of file. On server recovery, due to the installed download manager software the downloading of a file will start from the broken or paused downloads and continues till the end of file.

Draw the state machine diagram for the above description in Q5B. **(03)**

5C. Distinguish between incremental and evolutionary process models. List the limitations of incremental and evolutionary model. **(02)**