Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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A Constituent Institution of Manipal University

I SEMESTER M.TECH. (COMPUTER NETWORKING AND ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: SOFTWARE ENGINEERING [ICT 5102]

REVISED CREDIT SYSTEM
(26/11/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. For the Judiciary Information System (JIS) described below dr aw the use case diagram. Also, write the use case specification for any two use cases of the use case diagram drawn.
The attorney general's office wants to develop a JIS, to help handle court cases and also to make 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 (eg: theft), when committed (date), where committed (location), name of the arresting officer, and the date of the arrest are entered by the court registrar. 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 the 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 judgement 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 a trial. The judges should be able to browse through the old cases for guidance on their judgement. The lawyer should also be permitted to browse old cases, but should be charged for each old case they browse. **5**

1B. What is a software process? How is an organizations current state of process maturity assessed? Explain. **3**

1C. A textile organization wants to develop an Inventory Control System for its internal use. The requirements are well understood and scope is well constrained. However the project is required to be delivered within short period of time (as soon as possible). Propose a life cycle model for this scenario and provide reason for justification of your answer. **2**

2A. Consider the description of a movie booking management given below. The movie booking management system supports movie ordering and browsing of the movie **5**

catalogue, and user subscriptions with rechargeable cards. Only subscribers are allowed hiring movies with their own card. Credit is updated on the card during rent operations. Both users and subscribers can buy a movie and their data are saved in the related order. When a movie is not available it is ordered.

Identify the classes for the above problem statement and draw the class diagram for the same.

2B. What is the basic objective of SCM process? Explain the configuration management process. **3**

2C. Explain the types of requirements identified by the technique that translates the needs of the customer into technical requirements for software. **2**

3A. Explain the generic process framework of all software process models and also justify why spiral model is a realistic approach to the development of large-scale system and software when compared to systematic aspects of the waterfall model. **5**

3B. Create an activity diagram based on the following narrative of Booking a Room in a hotel process.

When customer requests a room, the hotel employee looks for room availability, then he insert customer's data and verifies if the provided credit card number has enough credit to pay the room: in this case the booking is confirmed and we wait customer arrival.

The Hotel information system allows customer to modify or cancel his/her reservation. If customer arrives he uses the room and then he pays, in case of no-show a penalty is accounted on his credit card and the booking is cancelled. **3**

3C. Mention the difference between the following concepts with respect to class diagram.

i. Cardinality and modality ii. Aggregation and composition **2**

4A. Identify a suitable software architectural style suitable for design of database applications and Explain the architecture style in detail. **5**

4B. Identify the critical path for the task network of a software project given in Table Q.4B using critical path project scheduling method.

Table Q.4B. Task Breakdown of the software project

Task	Duration in days	Dependencies
A	6	--
B	9	A
C	5	A
D	11	A
E	8	B
F	6	C,D,E

3

4C. Draw state transition diagram to model the behavior of the digital pet program described below: When the pet is turned on, it starts out happy. If the pet is happy and receives punishment, then he becomes sad. If the pet is sad and receives praise, it becomes happy. If the pet is sad and receives punishment, it is heart-broken **2**

5A. Explain the terms coupling, cohesion, and abstraction. Describe the effect of each of them on achieving effective modular design. **5**

5B. What is the use of white box testing? Explain the basis path testing technique with the procedure used to identify the largest of three numbers. **3**

5C. Assume that the size of an organic type software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 15,000/- per month. Determine the effort required to develop the software product and the nominal development time. **2**