

Reg. No.



**MANIPAL INSTITUTE OF TECHNOLOGY**

MANIPAL

(A constituent unit of MAHE, Manipal)

**I SEMESTER MCA**

**END SEMESTER EXAMINATIONS, FEB/MAR 2021**

**SUBJECT: SOFTWARE ENGINEERING [MCA 4154]**

**REVISED CREDIT SYSTEM**

**(3/3/2021)**

Time: 3 Hours

MAX. MARKS: 50

**Instructions to Candidates:**

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

<b>1A.</b>	Suppose each communication path between two people consumes approximately 2% of each person's time, for a project that requires 6 programmer months, how many people will be needed to finish the project in 3 months if : i. Democratic Decentralized team structure is used and if a chief programmer team structure is used? ii. If a team consists of 5 members, what would be the difference in the completion time for a team using the democratic structure and a team using the chief-programmer structure?	<b>5</b>
<b>1B.</b>	Suppose that testing detects only 90% of the total errors in utility softwares. By adding design and code reviews, the cost of both these phases increases by 10% each with 10% of the errors detected extra in both of these phases. (So testing now typically detects only 70% of the errors effectively). What is the impact on the overall cost of the software development positive or negative? Comment giving a proper example to justify the explanation.	<b>3</b>
<b>1C.</b>	Differentiate between Alpha and user acceptance testing. Which is more important to be done from a client perspective and Why?	<b>2</b>
<b>2A.</b>	Discuss the need of regression testing in a software project implementation. What is the need for Beta 1 and Beta 2 (final) testing? Why is the psychology of the tester important?	<b>5</b>
<b>2B.</b>	Explain why is it considered that a high fan out could be an indication of a very poor module design. Also specify the categories of modules that could be affected.	<b>3</b>
<b>2C.</b>	Testing often consumes more resources than any other phase in software development. List the major factors that make testing so expensive.	<b>2</b>
<b>3A.</b>	Differentiate between functional and glass-box testing with the help of an example case study.	<b>5</b>
<b>3B.</b>	What type and category of diagrams under the Unified Modelling Language (UML)	<b>3</b>



	terminology is indicative of Use-Case diagrams and also What purpose does it serve and is meant for understanding of which set of people in software development life cycle process?	
3C.	Prototyping allows the users to try out a working model of a system before the actual system is complete. Comment how prototyping can be counter-productive if it creates task interference during training?	2
4A.	Draw Sequence diagram and appropriate State Transition/Activity diagram for the process of opening a SB account for a student with ICICI/S.B.I bank after having taken admissions for MCA course at MIT Manipal using correct nomenclatures and appropriate symbols after identifying the bare necessary classes initially by filtering out the irrelevant ones .	5
4B.	<p>Consider the following case study :</p> <p>Software is being developed for an Online Hostel Information System. Students of an Institution can search Hostel catalog online to identify the required type of room with tariff. The student will apply for the room online and then visit the hostels to get the room. In case the particular type of room is not available or out of student's budget, the student will be put on the waiting list for a similar room. When the room is available, the hostel warden will send an email to the student, indicating that the room is available. The rooms are cleaned and sanitized by the particular hostel warden and issued to the student. The Hostel Information System keeps track of the rooms that are issued to each student. Each student can block a maximum of one room in a particular hostel at a time on a sharing or non sharing basis whether air conditioned or non air conditioned .</p> <ol style="list-style-type: none"> <li>Identify the actors in the Online Hostel Information System.</li> <li>Draw a swim lane/activity diagram to depict the interactions between the actors of the Online Hostel Information System .</li> </ol>	3
4C.	Why is that a SRS is said to be a very core part and prerequisite to a good design and subsequent software development?	2
5A.	<p>If an expert decision support system were to be developed which would help automate all the activities of autistic people and prove to be a worthy assist to them, eliminating the need of a care taker.</p> <ol style="list-style-type: none"> <li>Which process model should be ideally preferred?</li> <li>Which development approach should be opted top-down or bottom-up? Also highlight the suitable team structure that should be made operational along with the type of testing strategy and the actual type of testing to be followed.</li> </ol>	5
5B.	If some existing off the shelf modules are to be re-used in building a new system, should one use a top-down or bottom-up approach? Why?	3
5C.	Mention in what type of coupling, the complete data structure has to be passed from one module to another? Also mention the second worst form of coupling and the cohesion such a module will have with other modules.	2