Reg. No.
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# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

# **I SEMESTER MCA**

## **MAKE-UP EXAMINATIONS, JANUARY 2019**

### SUBJECT: SOFTWARE ENGINEERING AND PROJECT

## MANAGEMENT [MCA 4103]

#### REVISED CREDIT SYSTEM (28 /12/2018)

Time: 3 Hours

MAX. MARKS: 50

#### Instructions to Candidates:

- ✤ Answer ANY FIVE FULL questions.
- ✤ Missing data may be suitably assumed.

1A.	Suppose each communication path between two people consumes approximately 5% of each person's time. For a project that requires 12 programmer months, how many people will be needed to finish the project in 6 months if: <b>a</b> ) democratic decentralized team structure is used and <b>b</b> ) chief programmer team structure is used? If a team consists of 6 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?	5
1B.	What is structural testing? Explain the methods to perform structural testing.	3
1C.	Consider a program with many modules, if a static variable z and a sort() function is shared between two modules A and B, how would you design the modules to minimize coupling.	2
2A.	Discuss regression testing stressing upon situations where it is found to be most useful. Also differentiate between extreme programming and rapid application development models.	5
2B.	Discuss egoless team structure with an example case study of an appropriate software category	3
2C.	Which type of software development is suitable for spiral model? Is the number of loops fixed for different development projects? If not, explain how the number of loops in spiral model is determined.	2

3A.	Discuss structured design methodology with the help of a suitable student registration process.	5
3B.	<pre>What does the control flow graph (CFG) of a program represent? Draw the CFG for the following program:- int compute_gcd(int x, int y){    while(x!=y){      if(x&gt;y) then         x=x-y;      else y=y-x;      }    return x;}</pre>	3
3C.	If some existing modules are to be re-used in building a new system, will you use a top-down or bottom-up approach? Why?	2
4A.	Consider an organic application is to be developed. After the requirements, its total size is estimated to be 20000 LOC. Use the COCOMO model to determine the overall cost and schedule estimates for different phases with cost driver attributes namely CPLX=1.15, CAP=.86, TOOL=1.10, DATA=1.08. Also determine the staff required for different phases with average, minimum and maximum staff requirement.	5
4B.	Suppose that you plan to start an A/C Unisex mixed martial arts gym with options to either purchase, rent or get on lease the infrastructure. The outlet is supposed to be in a very sophisticated and up market area primarily consisting of a vibrant student population and also supposed to grow day by day with lots of new branches to come up in new locations. The setup if purchased would cost <b>\$70,000</b> with an additional <b>\$2500</b> for training and equipments to be made functional. For tax purposes the useful span of the setup is four years, maintenance cost per month will be around <b>\$30</b> . If purchased there will be finance option at a <b>8 percent</b> interest rate of the principal amount. As an alternative the setup can be rented for <b>\$2500</b> per month or leased for a <b>4</b> year period at an annual cost of <b>\$5500</b> . Remember rates for rent can vary every year depending on the market status, but lease amount would remain the same. i) Which is the best alternative financially for the manager? ii) What benefits does rental offer in the situation described?	3
4C.	Prototyping allows the users to try out a working model of a system before the actual system is complete. Explain how prototyping can be counter-productive if it creates task interference during training?	2
5A.	Discuss the risk management techniques for the following risk items. i) Personnel shortfalls ii) Gold Plating iii) Continuing stream of requirements	5
5B.	What are the major concepts that help make a program more readable?	3
5C.	Distinguish between error and failure. Which of the two is detected by testing? Justify your answer.	2