Reg. No.									

Manipal Institute of Technology

(A Constituent Institute of Manipal University)

I SEMESTER M. C. A.
END SEMESTER EXAMINATION – NOV/DEC 2015

SUBJECT: SOFTWARE ENGINEERING AND PROJECT MANAGEMENT [MCA-4103]
3/12/2015

Time : 3 hours Max. Marks : 50

Instructions to Candidates

1. Answer ANY FIVE FULL questions.
2. Missing data may be suitably assumed.

1A What is boundary value analysis? What is the role played by it in the preparation of good test oracles for testing process?

1B Suppose that a 45-KDSI utility program can be purchased for $8,00,000 assuming that in-house programmers cost $3720 per programmer months, would it be more cost-effective to buy the product or build it in-house? If the external company which is to provide the product were to charge an annual maintenance of $950 per year for a useful product span of 4 years, while the in-house maintenance amounts to just $125 per month, would you then be forced to change your decision?

1C Suppose testing detects only 85% of the total errors in utility softwares. By adding design and code reviews, suppose the cost of both these phases increases by 15% each with 15% of the errors detected extra in both of these phases.(So testing now detects only 55% of the errors effectively). What is the impact on the overall cost of the software positive or negative? Comment giving a proper example to justify your answer.

(5 + 3 + 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.

2B Discuss egoless team structure with an example case study of an appropriate software category.

2C Justify the statement "black box systems are easy to correct and modify".

(5 + 3 + 2)

3A Discuss a set of poor programming practices, based on the criteria of coupling and cohesion.

3B Give a regular expression for a national population survey company record consisting of serialnumber, BPO/APO, number of members, annual salary, address, contact number.

3C The manager of a Volkswagen showroom plans to either purchase, rent or lease an automated software simulation system. The outlet is growing day by day with lots of new branches in cities. The software if purchased would cost $8500 with an additional $400 for software,training and installation. For tax purposes the useful span of the system is four years, maintenance cost per month will be around $28.If purchased the system would be financed at 8 percent interest rate of the principal amount. As an alternative the system can be rented for $220 per month or leased for a 4 year period at a monthly cost of $310. 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?

(5 + 3 + 2)

4A Consider cost of developing an organic application consisting of four modules with sizes 2K,1K,2K and 2K respectively. Use the COCOMO model to determine the overall cost and schedule estimates for different phases with cost driver attributes namely CPLX=1.30,ACAP=1.19,TOOL=0.83,DATA=1.16. Also determine the staff requirements for different phases with average minimum and maximum staff requirements.

4B If cyclomatic complexity of a module is much higher than the suggested limit of 10,what should be done ideally to reduce it giving proper explanation guidelines?

4C If a software on virtualization were to be developed, which process model would be ideally preferred and which development approach would be more likely to be pursued top-down or bottom-up? Justify your answer with meaningful arguments. Also highlight the suitable team structure that should be made operational. How would the answer change in case of any such software existing in the market as reference points to base the software on?

(5 + 3 + 2)

5A What are the potential problems that can arise in software maintenance due to different types of inheritance?

5B How can the "maintainability" and "userfriendliness" of a software system be specified in quantitative terms?

5C What is the cohesion of the following module? How would you change the module to increase the cohesion also comment on the coupling achieved in the process?

```
Procedure CasinoGambleForTwo()
Begin
    Give the counters initially to both
    L1:
        Initialize and accept both input values
        Call a random no generator routine
        Find the nearest match and declare winner
        If more players available Goto L1
End
```

(5 + 3 + 2)

6A 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?

6B Differentiate between OOA and OOD. Discuss and explain with a concrete example?

6C If a module has sequential cohesion, what kind of coupling is this module likely to have with others? Justify your answer.

(5 + 3 + 2)