MASTER OF COMPUTER APPLICATIONS

MCA 302: SOFTWARE ENGINEERING

III Sem, Nov/Dec 2016

Time: 3 Hour **Total Marks: 70**

Attempt all questions.

Parts of a question must be answered together.

1.

a. It seems odd that cost and schedule estimates are developed during software project planning – before detailed software requirements analysis or design has been conducted. Why do you think this is done? Are there circumstances when it should not be done? [2]

b. What does a "win-win" mean in the context of negotiation during the requirement engineering process? [2]

c. Which of the two parameters a or b in $b^* KLOC^a$, has more evident impact on the values of effort in the basic COCOMO model? Justify your answer. [2]

d. You have been testing a module for 4 days and found one fault. What does this tell you about the existence of other faults? [2]

e. Can a program be correct and still not exhibit good quality? Explain. [2]

2.

a. What are prescriptive process models? Explain how these are different from agile process models. [3]

b. What is a spike solution in XP? [2]

c. A small program reads three integer values representing the inputs and prints a message stating whether the triangle is scalene, isosceles, or equilateral. Show a flowchart of the program. Suggest a white-box testing methodology and develop relevant test cases. [5]

3.

Suppose a system for office automation is to be designed. It is clear from the requirements that there will be five modules of size 0.5 KLOC, 1.5 KLOC, 2.0 KLOC, 1.0 KLOC and 2.0 KLOC respectively. Complexity and reliability requirements are high (take effort multiplier 1.15 each for high rating). Programmer's capability and experience is low (take effort multipliers as 1.17 and 1.07 respectively). All other factors are of nominal rating (effort multiplier 1.0 for each nominal rating). Use basic COCOMO model to determine overall effort, development time and manpower estimates (Assume a = 2.4, b = 1.05, c = 2.5, d = 0.38). [10]

4.

a. What do you understand by project risks? Explain the concept of Risk Mitigation, Monitoring, and Management with the help of examples. [5]

b. How is reactive risk management different from proactive risk management? Explain with help of an example. [3]

OR

c. What is a successful test? Why is a highly coupled module difficult to unit test? [2]

5.

a. What is the difference between white and black box testing? Is it correct to claim that if white box testing is done properly, it will achieve close to 100% path coverage? Will exhaustive testing (even if it is possible for very small programs) guarantee that the program is 100% correct? [4]

b. Assume that testing (and bug fixing) effort is proportional to the number of errors detected (regardless of the nature of error). Suppose that testing detects 90% of the total errors in the software (10% remain undetected). By adding design and code reviews, suppose the cost of the design and coding phases increases by 10% each (from the base distribution given earlier), and 10% of the errors are detected in design reviews and 10% in the code reviews. (So, testing now detects only 70 % of the errors.) What is the impact on the overall cost of reviews? [6]

6. Write short notes on the following:
   (a) Agile process models
   (b) Software project planning
   (c) Software quality
   (d) Software testing

[10]

7. Differentiate between the following:
   (a) Layered Architecture and Data-Centered Architecture
   (b) Known risks and predictable risks
   (c) Testing and debugging
   (d) Validation testing and system testing

[10]