MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104

FIFTH SEMESTER B.E
Makeup Examination-December 2010
Software Engineering(CSE 303)

TiME : 3 HOURS   MAX. MARKS :50

Instructions to Candidates
1. Answer any 5 full questions
2. Answer should be clear and concise in point form
3. Missing data can be suitably assumed

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1. Which life cycle model would you follow for developing software for the following applications? Mention the reasons behind your choice for the particular life cycle model?
(10 marks)

(a) An extremely large software that would provide, monitor and control cellular communication among its subsidiaries using a set of revolving satellites.
(b) A new library automation software that would link various libraries of the university.
(c) A compiler for the new language.
(d) A Graphical User Interface part of a large software.
(e) A small well understood billing system for a canteen.

2.a)List out the differences between GANT chart and PERT chart with help of examples
(2 marks)
b) Explain 3 types of team structures.   (3 marks)
c).State whether TRUE or FALSE **with Reasons for your choice**   (5 marks)
i)According to COCOMO model cost is the most fundamental attribute of a software product, based on which size and effort are estimated.
ii) When a task along a critical path is completed in less time than the originally estimated it should result in faster completion of the project.

3)a)Consider the following requirement for a software to be developed for controlling a chemical plant. The chemical plant has a number of emergency conditions. When any of the emergency conditions occurs, some pre specified actions should be taken. The different emergency conditions and the corresponding actions that need to be taken are as follows:
i)If the temperature of the chemical plant exceeds $T_1 \circ$ C, then the water shower should be turned ON and the heater should be turned OFF.
ii)If the temperature of the chemical tank falls below $T_2 \circ$ C, then the heater should be turned ON and the water shower should be turned OFF.

iii) If the pressure of the chemical plant is above P1, then the valve v1 should be OPENED.

iv) If the chemical concentration of the tank rises above M, and the temperature of the tank is more than T $_3$° C, then the water shower should be turned ON.

v) If the pressure rises above P3 and the temperature rises above T_1 ° C, then the water shower should be turned ON, valves v1 and v2 are OPENED and the alarm bells sounded.

Write the requirements of this chemical plant software in the form of a decision table. (6 marks)

b)Write the pre- and post-conditions to axiomatically specify the following functions: (4 marks)

i)A function named square-array creates a 10 element array where the value of any array element is square of its index.

ii)A function sort takes an integer array as its argument and sorts the input array in ascending order.

4a)Explain the characteristics of a good software design. (4 marks)

b)A software system called RMS calculating software reads three integral numbers from the user in the range between -1000 and +1000 and determines the root mean square (rms) of the three input numbers and then displays it. Write the data dictionary for the given problem. (3 marks)

c)Briefly explain the properties of algebraic specification. (3 marks)

5)a) Using coding standards and guidelines, write a highly cohesive program to find all the roots of a quadratic equation (5 marks)

b) Describe testing in the large and testing in the small. (2 marks)

c) What are the different white box testing strategies? Explain. (3 marks)

6)a) Explain the different reliability metrics used to quantify the reliability of software products. (6 marks)

b) Describe the quality factors associated with a software product (4 marks)