**P1500**

## [3764] - 433

## B.E (IT)

# SOFTWARE TESTING AND QUALITY ASSURANCE

## (2003 Course) (414444)

*Time : 3 Hours]*                                              *[Max. Marks : 100*

*Instructions to the candidates:*

   *1)   Answer question 1 or 2, 3 or 4 and 5 or 6 from section - I and question 7 or 8, 9 or 10 from section - II*

   *2)   Question 11 is compulsory.*

   *3)   Answers to the two sections should be written in separate answer books.*

   *4)   Neat diagrams must be drawn wherever necessary.*

   *5)   Figures to the right indicate full marks.*

   *6)   Assume suitable data if necessary.*

## SECTION - I

*Q1)* a)   Define any 4 of the following terms
   i)    Failures.
   ii)   Faults.
   iii)  Test Bed.
   iv)   Defects.
   v)    Errors.
   vi)   Software Quality.                                        [8]

   b)   Explain in short any four methods of System Level Testing.   [8]

OR

*Q2)* a)   Is complete testing possible? When to stop testing? Explain the difference between random testing and testing using error guessing.   [8]

   b)   With reference to any hypothetical software identify following types of bugs.

   i)    S/W doesn't do something that the product specification says it should do.

   ii)   S/W does something that the product specification says it shouldn't do.

   iii)  S/W does something that the product specification doesn't mention.

iv) S/W doesn't do something that the product specification doesn't mention but should. [8]

**Q3)** a) Explain in detail a test plan template. [8]

b) Explain what is test case database, defect repository and configuration management repository in context of test infrastructure management.
[8]

OR

**Q4)** (a) Explain in details different functions (responsibilities) to be handled in a testing life cycle or process. [8]

(b) Draw control flow graph for the code given below. Clearly label each node so that it is linked to its corresponding statement. Calculate its cyclomatic complexity. How can this value be used to measure testability? Describe how cyclomatic complexity number and the flow graph be used to design a set of white box tests for this module that would at least cover all its branches. [8]

```
module foo()      /* a[ ] and b [ ] are global variables */
      begin
            int i , x
            i = 1
            read (x)
            while (i<x) do begin
            a[i] = b [i] *x
            if a [i] > 50 then
                        print ("array a is over the limit")
            else
                        print ("ok")
            i = i+1
            end
            print ("end of nonsense")
      end.
```

**Q5)** a) Explain with example the GQM method for identifying software measures.
[10]

b) Explain different types of measurement scales with examples. [8]

OR

**Q6)** a) What is customer problem metric? What are approaches to achieve low PUM? [10]

b) Explain the importance of the metric - *percentage delinquent fixes* in context with software maintenance. [8]

# SECTION - II

**Q7)** a) What is meant by software quality control? Explain the method of measuring software reliability as a software quality attribute. **[8]**

b) How is software usability measured? Describe different usability testing methods. **[8]**

OR

**Q8)** a) Enumerate Ishikawa's Seven Basic Quality Tools. Explain any two in details. **[8]**

b) What are the different components of costs, for quality software. Explain in details. **[8]**

**Q9)** a) Explain the key process areas of CMM level 3. **[8]**

b) A software manufacturer is experiencing a delay in delivery time because of skilled programmers leaving the organization. What would be a typical solution for this problem and a six sigma solution for the same. **[8]**

OR

**Q10)** a) Explain the Software Project Tracking & Oversight (SPTO) KPA of the CMM level 2. **[8]**

b) Explain the PDCA cycle in details with reference to ISO 9000:9001. **[8]**

**Q11)** Write short notes on ANY three. **[18]**

a) Client-Server Testing Techniques.

b) Functional Testing of Website.

c) Difference between web application testing and client/server testing.

d) Importance of code review in software security testing.

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