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[4064]-603

B.E. (IT)

SOFTWARE TESTING AND QUALITY ASSURANCE**(2008 Course) (414442) (Sem. - I)**

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answer question number 1 or 2, 3 or 4, 5 or 6 from section- I.
- 2) Answer question number 7 or 8, 9 or 10, 11 from section- II.
- 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 four of the following terms.

- i) Failure
- ii) Faults
- iii) Test Bed
- iv) Defects
- v) Errors
- vi) Software Quality. [8]

b) Differentiate between software verification and software validity. [8]

OR

Q2) a) Explain in short any four methods of System Level Testing. [8]

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

Q3) a) Explain in detail different functions (responsibilities) to be handled in a testing life cycle or process. [8]

b) Explain with example Equivalence class partitioning and Boundary value analysis. [8]

OR

P.T.O.

Q4) a) Describe the software defect life cycle. [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.

```
module foo () /* a[] and b[] are global variables*/ [8]
```

```
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 different types of measurement scales. [6]

b) Explain Product, Process and Resources with respect to their Internal and External attributes. [8]

c) Identify Questions and Metrics for the following Goal :- [4]
"Evaluate Effectiveness of coding standard"

OR

Q6) Spell-checker specification: "The checker accepts as input a document file and an optional personal dictionary file. The checker lists all words not contained in either of these files. The user can query the number of words processed and the number of spelling errors found at any stage during processing". [18]

Item	Weighting Factor		
	Simple	Average	Complex
External Inputs	3	4	6
External Outputs	4	5	7
External Inquiries	3	4	6
External Files	7	10	15
Logical Internal Files	5	7	10

It seems reasonable to assume that out of 14 factors, two factors has rating as 5 and six factors has rating as 3 and remaining six has rating as 0 on a scale of 0 to 5. Where 0 means irrelevant, 3 means it is average and 5 means it is essential to the system being built.

Based on the above perform the following:

- Draw pictorial representation of the system.
- Identify internal logical files, external I/P, O/P, Inquiries and Files.
- Calculate Function Count (FC).
- Calculate Technical Complexity Factor(TCF).
- Calculate Function Point (FP).
- Explain the use of FP.

SECTION - II

- Q7) a) What does SQA ensure? What are the goals of SQA activity? [8]
- b) Write a note on :
- Scatter diagrams
 - Cause and effect diagrams

[10]

OR

- Q8) a) Explain following Software reliability Quality Attributes:
- Correctness
 - Reliability
 - Usability
 - Integrity
 - Portability

[10]

- b) Explain the following Quality concepts -
- Quality
 - Quality Control
 - Quality Assurance
 - Cost of quality

[8]

Q9) a) Explain with example the six-sigma measure of software quality. [8]

b) List all the requirements of ISO 9000 and ISO 9001. [8]

OR

Q10) a) List and Explain Maturity Levels in the CMM. [8]

b) How is defect prevention and process change management brought into practice? [8]

Q11) Explain any four KPAs: [16]

- a) Requirements Management (RM)**
- b) Software Project Tracking and Oversight (SPTO)**
- c) Software Configuration Management (SCM)**
- d) Organization process Definition (OPD)**
- e) Software Product Engineering (SPE)**
- f) Peer Reviews (PR).**

