Total No. of Questions : 11] **[Total No. of Pages : 3**

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## [3864] - 418

B.E. (IT)

SOFTWARE TESTING AND QUALITY ASSURANCE

(2003 Course) (414444)

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

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

OR

Q2) a) Define any four of the following terms : **[8]**

i) Failure. ii) Faults.

iii) Test Bed. iv) Defects.

v) Errors. vi) Software Quality.

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

Q3) a) Explain in detail Test Plan Template. **[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 it's 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 * /
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.
```

[8]

OR

Q4) a) Explain unit test planning in details. **[8]**

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

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

b) Write short notes on : **[8]**

i) Product quality metrics.

ii) In-process quality metrics.

OR

Q6) a) Explain the importance of the metric - *percentage delinquent fixes* in context with software maintenance. Also calculate *percentage delinquent fixes* (pdf)_ if number of fixes delivered in a specified time are 40 and the number of fixes that exceeded the response time criteria by severity level are 80. **[10]**

b) Write a note on Control Flow Structures. Also focus on sequencing and nesting of flow graphs. **[8]**

SECTION - II

Q7) a) Enumerate Ishikawa's seven basic quality tools. Explain any two in detail. **[8]**

b) Illustrate with examples the use of following techniques in improving quality : **[8]**

i) Code inspection.

ii) Project Planning.

OR

Q8) a) What does SQA ensure? What are the goals of SQA activity? **[6]**

b) Write a note on : **[10]**

i) Scatter diagrams.

ii) Cause and effect diagrams.

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

b) Draw a neatly labeled Cleanroom process. Explain how step wise refinement process helps in improving the quality. **[8]**

OR

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

b) Describe in brief Software Configuration Management (SCM). **[8]**

Q11) Write short notes on any three : **[18]**

a) Class Testing.

b) Functional testing of Web-site.

c) Client-Server Testing techniques.

d) Importance of code review in software security testing.

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