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06CS842

Eighth Semester B.E. Degree Examination, June/July 2011
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions selecting at least TWO questions from each part.***

PART – A

1 a. Explain errors, faults and failures in the process of programming and testing with a flow diagram. **(08 Marks)**

b. What are the quality attributes of software? Explain in detail. **(12 Marks)**

2 a. Explain control flow graph. Write CFG for the following code:

```
1. Begin
2. Int a, b, large
3. Input a, b
4. if a > b
5.     large = a;
6. else
7.     large = b;
8. Output large
9. End
```

(10 Marks)

b. Explain the five different types of classifiers. **(10 Marks)**

3 a. Write the systematic procedure for equivalence partitioning. **(10 Marks)**

b. Explain the steps in the category partition method. **(10 Marks)**

4 a. Explain the notations used in cause effect graphing. **(10 Marks)**

b. What is decision table? What is its composition? **(10 Marks)**

PART – B

5 a. What is structural (code based) testing? Why to use white box testing, when black box testing is used to test conformance to requirements? **(06 Marks)**

b. Which are different code based testing and adequacy criteria? Explain in detail. **(14 Marks)**

6 a. Explain data dependence and control dependence graphs. **(10 Marks)**

b. Construct PDG (Program dependence graph) for the following program:

```
1. Begin
2. Int x, y, power
3. float z
4. input (x, y)
5. if (y < 0)
6.     power = - y;
7. else
8.     power = y;
9. z = 1
10. while (power != 0) {
11. z = z * x
12. power = power – 1;
13. }
14. if (y < 0)
15. z = 1/z;
16. output (z)
17. end
```

(10 Marks)

7 a. What is scaffolding? Explain the purpose of scaffolding. **(05 Marks)**

b. What is test oracle? What are its advantages and disadvantages over human oracle? **(05 Marks)**

c. Explain the following testing terms:
Test case, test case specification, test obligation, test suite, test or test execution, adequacy criteria. **(10 Marks)**

8 a. Explain cleanroom with neat diagram. **(10 Marks)**

b. Write short notes on the following :
i) Regression testing
ii) Walkthroughs and inspection. **(10 Marks)**

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06IS81

Eighth Semester B.E. Degree Examination, June/July 2011
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions selecting at least TWO questions from each part.***

PART – A

1 a. Explain the static and dynamic software quality attributes. **(08 Marks)**
b. Briefly explain the different types of test metrics. **(08 Marks)**
c. What are input domain and program correctness? **(04 Marks)**

2 a. Explain how the control flow graph assists the testers in the analysis of a program to understand its behavior in terms of the flow of control with relevant examples. **(10 Marks)**
b. Describe the following test classifiers :
i) Source of test generation ; ii) Life cycle phase ; iii) Test process models. **(10 Marks)**

3 a. Describe the steps involved in a systematic procedure for equivalence partitioning by considering boiler control system as an example. **(10 Marks)**
b. Explain the steps involved in the generation of tests using the category partition method with suitable examples. **(10 Marks)**

4 a. Explain the notations used in cause-effect graphing and describe the creation of cause – effect graphs for GUI – based computer system. **(10 Marks)**
b. Briefly explain the procedure for generating the BOR – constraint set and BRO – constraint set from abstract syntax tree of ca predicate Pr. **(10 Marks)**

PART – B

5 a. Describe the following with an example :
i) Statement testing ; ii) Branch testing. **(10 Marks)**
b. Explain the path testing for C–function for searching to nearly and dynamically re-arranging a linked list. Also describe the control flow graph for the above C – function. **(10 Marks)**

6 a. Describe the algorithms for available expressions classical data flow analysis with an example using control flow graph. **(10 Marks)**
b. Explain the data flow testing criteria ad data flow coverage with complex structures. **(10 Marks)**

7 a. Explain the adequacy criteria. **(08 Marks)**
b. Describe the test oracles with a neat diagram. **(08 Marks)**
c. What is scaffolding? Explain. **(04 Marks)**

8 a. Explain in detail the integration testing strategies. Describe the use of integration testing in detecting the memory leaks. **(10 Marks)**
b. Describe the following types of testing :
i) System testing ; ii) Acceptance testing. **(10 Marks)**

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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06IS81

Eighth Semester B.E. Degree Examination, June/July 2013

Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain in detail the various measures of software quality attributes. **(08 Marks)**
b. With a suitable example, explain how will you specify program bahviour. **(04 Marks)**
c. Briefly explain the concepts of test metrics. **(08 Marks)**

2 a. Explain the concepts of defect management. **(04 Marks)**
b. Explain in detail the several strategies for test generation. **(08 Marks)**
c. With a neat sketch, explain the elements of model checking. **(08 Marks)**

3 a. Briefly explain the concepts of unidimensional versus multidimensional partitioning. **(06 Marks)**
b. Name and explain the four steps which are helpful in creating the equivalence class. **(06 Marks)**
c. With a neat sketch, explain in detail the steps involved in the generation of tests using the category-partition method. **(08 Marks)**

4 a. Explain the procedures which are used for the generation of tests using cause-effect graphing. **(05 Marks)**
b. With a neat sketch, explain the notation used in cause-effect graphing. **(05 Marks)**
c. Briefly describe the fault model for predicate testing. **(05 Marks)**
d. Explain the usage of predicate testing in practice. **(05 Marks)**

PART – B

5 a. Explain the concepts of statement testing. **(05 Marks)**
b. Briefly explain the concepts of branch testing. **(05 Marks)**
c. Explain in detail the concepts of path testing with a suitable example. **(10 Marks)**

6 a. What do you mean by definition – use pairs? **(05 Marks)**
b. Explain the concepts of data dependence graph with a suitable example. **(05 Marks)**
c. Briefly explain the concepts of data flow analysis. **(05 Marks)**
d. Define data flow testing criteria with respect to DU pairs. **(05 Marks)**

7 a. What are the differences between test case and test case specifications? **(05 Marks)**
b. Define the term adequacy criteria with a suitable example. **(05 Marks)**
c Briefly explain the concepts of scaffolding. **(05 Marks)**
d. Explain the concepts of self-checks as oracles. **(05 Marks)**

8 Write short notes on the following concepts:
a. Memory leaks
b. System testing
c. Acceptance testing
d. Integration testing **(20 Marks)**

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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06IS81

Eighth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Software Testing

Time: 3 hrs. Max. Marks:100

Note: *Answer FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. List all the human errors in testing. (05 Marks)

b. Explain with a figure, errors, faults and failures in the process of programming and testing. (10 Marks)

c. Explain the different dynamic quality attributes. (05 Marks)

2 a. Explain with example, the execution history of 'C' program. (06 Marks)

b. Explain the following methods of testing :
i) Walkthroughs ii) Inspections iii) Use of static code analysis tools. (06 Marks)

c. Write a 'C' program to search the element in a list by using binary search method and represent :
i) All the basic blocks present in the program
ii) Flow graph for the above program. (08 Marks)

3 a. Explain with a figure, the different steps involved in the generation of tests using the category partition method. (10 Marks)

b. An application takes two inputs x and y where $3 \le x \le 7$ and $5 \le y \le 9$
i) Partition the input domains using unidimensional and multidimensional partitioning
ii) Give the geometric representation of equivalence classes. (10 Marks)

4 a. Write a procedure for generation a decision table from a cause effect graph. (10 Marks)

b. Explain with examples, the predicates and Boolean expressions. (10 Marks)

PART – B

5 Explain the following structural testing with the help of 'C' program and its control flow graph
a. Statement testing
b. Branch testing
c, Path testing
d. Procedure call testing. (20 Marks)

6 a. Write a 'C' program to find the GCD of two positive integers and draw the :
i) Control flow graph of GCD ii) Data dependence graph of GCD. (10 Marks)

b. Write the algorithm for reaching definition. (05 Marks)

c. Explain the data flow testing criteria, with suitable example. (05 Marks)

7 a. Explain the test specifications and cases, with suitable example. (10 Marks)

b. Explain with a figure, the test harness with a comparison based test oracle. (06 Marks)

c. Explain the capture and replay process. (04 Marks)

8 Write short notes on :
a. Integration testing strategies
b. System testing
c. Regression testing
d. Test case prioritization and selective execution. (20 Marks)

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10CS842

Eighth Semester B.E. Degree Examination, Dec.2014/Jan. 2015
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Define the terms : error, fault, failure, test and test case. **(05 Marks)**

b. Draw a neat flowchart for the traditional triangle program implementation. **(05 Marks)**

c. Define the problem statement of the NextDate function and write its implementation program. **(10 Marks)**

2 a. Explain the following : Boundary Value Analysis, Robustness testing and special value testing. **(06 Marks)**

b. Explain the equivalence class test cases for the commission problem. **(06 Marks)**

c. What are decision tables? Explain the basic decision table terms and write a decision table for the triangle problem. **(08 Marks)**

3 a. Define basis path testing. Explain the McCabe's basis path method with suitable example. **(10 Marks)**

b. Design a program graph and DD – path graph for the commission program. **(10 Marks)**

4 a. Explain the simple Automatic Teller Machine (SATM) system with screens, context diagram and entity/relationship model. **(10 Marks)**

b. Explain Top-down, Bottom-up and sandwich integration, with a suitable example. **(10 Marks)**

PART – B

5 a. Explain the functional strategies for thread testing. **(10 Marks)**

b. Distinguish progression and regression testing methods. **(05 Marks)**

c. Write a note on client/server testing. **(05 Marks)**

6 a. Explain validation and verification activities, with suitable examples. **(05 Marks)**

b. Discuss various dependability properties used in software testing and analysis activities. **(05 Marks)**

c. Explain the following forms :sensitivity, redundancy, partition, visibility and feedback. **(10 Marks)**

7 a. What is meant by fault – based testing? Discuss the assumptions involved in fault – based testing. **(05 Marks)**

b. Explain the concept of self –based as oracles. **(07 Marks)**

c. Define scaffolding. With a suitable example, discuss generic versus specific scaffolding concepts. **(08 Marks)**

8 a. Write short notes on : cleanroom process model and the quality team. **(10 Marks)**

b. Explain the standard organization of an analysis and test plan, in detail. **(10 Marks)**

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10CS842

Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. What are the two fundamental approaches used to identify test cases? Explain each of them. **(06 Marks)**

b. Discuss the traditional and structural implementation of triangle problem. **(08 Marks)**

c. What is random testing? Write the test cases for the next date function. **(06 Marks)**

2 a. Write the equivalence class test case for the commission problem. **(06 Marks)**

b. Enlist the guidelines and observations of equivalence class testing. **(07 Marks)**

c. Construct the decision tree for next date function for third try and write the test cases for the same. **(07 Marks)**

3 a. Discuss the DD – path for trainable program and write a table for the types of DD – paths with graph. **(06 Marks)**

b. Explain McCabe's basis path method with an illustrative example. **(08 Marks)**

c. With a suitable example, discuss slice – based testing. **(06 Marks)**

4 a. With regard to levels of testing, describe the decomposition tree for the SATM system. **(06 Marks)**

b. What is call – graph – based integration? Explain the two approaches employed in this strategy explicitly indicating the pros and cons of each. **(06 Marks)**

c. With an illustrative example like SATM system discuss the accomplishment of path – based integration. **(08 Marks)**

PART – B

5 a. Explain the basic concepts for requirements specification that support the tester's process of thread identification. **(07 Marks)**

b. Describe the following approaches used in functional strategies for thread testing :
i) Event – based thread testing
ii) Part – based thread testing
iii) Data – based thread testing. **(07 Marks)**

c. Discuss how the interaction testing is accomplished in client/server systems. **(06 Marks)**

6 a. With an aid of a neat functional schematic, explain the different verification trade–off dimensions (degrees of freedom). **(06 Marks)**

b. Discuss in brief, the six principles that characterize various approaches and techniques for analyzing and testing software projects. **(06 Marks)**

c. Enlist the dependability properties of a software product and further illustrate the relation among these dependability properties, with a suitable diagram. **(08 Marks)**

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10CS842

Eighth Semester B.E. Degree Examination, June/July 2015
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. With neat diagram, explain the SATM system. **(10 Marks)**
b. Briefly explain about functional testing and structural testing. **(10 Marks)**

2 a. Explain about decision tables, construct decision table of triangle problem, it accepts three integer a, b and c as three sides inputs equilateral, scalene, isocelis or not a triangle and satisfy the following conditions $a < b + c$, $b < a + c$ and $c < a + b$? **(10 Marks)**
b. With example, explain boundary value analysis and mention its limitations. **(04 Marks)**
c. Differentiate between weak robust equivalence class testing and strong robust equivalence class testing. **(06 Marks)**

3 a. Explain about du-path test coverage matrices with data flow diagram. **(05 Marks)**
b. Explain about test coverage matrices. **(10 Marks)**
c. Explain McCabe's basis path method. **(05 Marks)**

4 a. With neat diagram, explain the traditional view of testing levels of waterfall life cycle and rapid prototyping life cycle. **(10 Marks)**
b. Explain TOP – DOWN integration and bottom – up integration with suitable example. **(10 Marks)**

PART – B

5 a. Explain about client /server testing. **(10 Marks)**
b. Explain about functional strategies for thread testing. **(10 Marks)**

6 a. With neat diagram, explain the validation and verification activities check work product against actual user requirements. **(10 Marks)**
b. Explain the following :
i) Sensitivity
ii) Redundancy
iii) Visibility
iv) Restriction
v) Partition. **(10 Marks)**

7 a. Describe the test oracles with a neat diagram. **(10 Marks)**
b. Explain the fault based adequacy criteria. **(10 Marks)**

8 Write a note on :
a. Quality goal
b. Test and analysis strategies and plan
c. Risk management
d. Monitoring the process. **(20 Marks)**

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10CS842

Eighth Semester B.E. Degree Examination, June/July 2016
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. With a neat diagram of a testing life cycle explain following :
i) Fault ii) Failure iii) Incident iv) Test case **(10 Marks)**

b. With a neat sketch, explain the features of 'The SATM' system. **(10 Marks)**

2 a. Explain the following :
i) Robustness testing ii) Worst – case testing. **(08 Marks)**

b. Describe the equivalence class test cases for 'The triangle problem'. **(12 Marks)**

3 a. Define the program graph. Write a structured triangle program and the program graph. **(10 Marks)**

b. For the program graph G(P) and a set of program variable, define the terms 'Defining node of a variable', 'Definition use path with respect to a variable 'All-Defs criterion', 'All C-uses/some p-used and 'All du-paths criterion'. **(10 Marks)**

4 a. Briefly explain the specification – based life – cycle models in levels of testing. **(10 Marks)**

b. What is decomposition based integration? Define the different types of decomposition based integration. **(10 Marks)**

PART – B

5 a. Briefly explain the basic concepts for requirements specification in system testing. **(10 Marks)**

b. Write a short note on: 'taxonomy of interactions' and 'Client/ Server testing'. **(10 Marks)**

6 a. List and explain any four principles that characterize various approaches and techniques for analysis and testing. **(10 Marks)**

b. Explain how does the goals of quality process improvement can be accomplished for analysis and testing of a software. **(10 Marks)**

7 a. What is fault – based testing? Define the terminologies 'Program location' and 'Alternate expression'. **(06 Marks)**

b. Define scaffolding? Mention the purposes of scaffolding. **(04 Marks)**

c. What is a test oracle? With a neat diagram explain the comparison based test oracle. **(10 Marks)**

8 a. Discuss the risks generic to process management and risks specific to quality management with a suitable example. **(10 Marks)**

b. Discuss the basic elements of analysis and test plan. **(10 Marks)**

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06IS81

Eighth Semester B.E. Degree Examination, June/July 2014
Software Testing

Time: 3 hrs. Max. Marks:100

Note: *Answer FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1 a. Define terms error, fault and failure. Explain with a block diagram, the separation of observable behaviour from observed behaviour. (06 Marks)

b. Define test metrics. Explain three types of test metrics. Define test plan with example. (08 Marks)

c. Explain software quality attributes. Give block diagram for test and debug cycle. (06 Marks)

2 a. Explain: i) Defect management, ii) Software and hardware testing. (06 Marks)

b. Explain static testing and its integral parts. (06 Marks)

c. What are different types of testing? Explain test process model in detail. (08 Marks)

3 a. Explain with neat block diagram steps in category partition method. (08 Marks)

b. Give suitable guidelines for partitioning variables into equivalence classes based on their type. (04 Marks)

c. Give systematic procedure for equivalence partitioning and with example explain discard infeasible equivalence classes. (08 Marks)

4 a. Explain cause-effect graphing and give a brief description of constraints with CEG. (06 Marks)

b. Generate BOR-constraint set algorithm. Give predicates for expression $a < b \wedge c > d$. (06 Marks)

c. Compute BOR-constraint set for predicate $p : (a + b < c) \wedge \neg p \vee (r > s)$. (08 Marks)

PART – B

5 a. Explain infeasibility problem with respect to structural testing. (06 Marks)

b. Explain: i) Statement coverage ii) Branch adequacy criterion iii) MC/DC iv) Path adequacy criterion. (08 Marks)

c. Explain the following: i) LCSAJ testing ii) Cyclomatic testing (06 Marks)

6 a. Give control dependence and data dependence graph for Euclid's algorithm for GCD. (06 Marks)

b. Give an work-list algorithm to compute reaching definitions. (08 Marks)

c. Define: i) DU pair ii) Forward analysis iii) Power set lattice (06 Marks)

7 a. Explain term scaffolding with respect to test execution. Explain types of scaffolding. (10 Marks)

b. Explain: i) Capture and replay ii) Test Oracles iii) Adequacy criterion iv) Test suite v) Test execution. (10 Marks)

8 a. Give differences between system, acceptance and regression testing. (06 Marks)

b. Explain difference between alpha and beta testing. (04 Marks)

c. Explain integration testing strategies. (10 Marks)

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