Software Testing Revision Questions 2018
Part I -Theory Questions

In the context of software testing define the following terms: [6 marks]
  i.   Errors
  ii. Faults
  iii. Failures

"The objective of software testing is all about finding software faults". Can you list and explain 5 categories of software faults?

Explain any *three* of the following types of software faults:

  a. Documentation faults
  b. Stress or overload faults
  c. Throughput or performance faults
  d. Recovery faults
  e. Syntax Faults

In the context of examining the failure curve and the design of testing methods give *three* important differences between hardware and software.

'The classification of failures is more difficult than faults. One approach is to classify a failure by its level on a severity scale' Give an outline description of a scale that has *four* different levels of Failure Severity.

Explain the approach to software development that is known as 'Big Bang'. Give two drawbacks to using it.

What advantages does incremental software testing over the Big Bang approach (i.e. testing all at once)?

Can software be tested exhaustively?

Why is Exhaustive Testing not recommended as an approach for software testing?

Give one sentence to explain each of these.
Deciding when the testing of a piece of software should finish can be difficult to judge. Can you suggest two different criteria or benchmarks that could be useful to a Software Testing manager when making that decision?

Finishing testing can take three points of view: [3 marks]
  i.   Budgetary

ii.   Activity

iii.   Risk management

Describe the differences between static and dynamic testing.

Give a short (*3 lines only*) definition of the following Software Testing activities

     i.   Unit Testing

     ii.   Integration Testing

     iii.   System Testing

     iv.   Acceptance Testing

Using diagrams to illustrate your answer, explain the procedures for

     (i) Top-down integration testing

and

     (ii) Bottom-up integration testing.

Drivers and Stubs are important components in the implementation of the Integration testing methods of (i) and (ii). Give definitions for what a Driver is and what a Stub is.

Give a practical example that describes how a Driver and Stub might be used in the testing of a piece of software. Use a diagram to illustrate your answer.

In the context of the architecture of the XUnit test framework give *one-line* definitions of the following

- Test runner
- Test fixtures
- Test suites
- Test Result

Explain three differences between Black-box testing and White-box testing.

Using an example, show what the difference is between an Error of Commission and Error of Omission as they can occur in Black and White box testing respectively.

Define the following <u>two</u> terms and say which one is associated with Black box testing and which with White box testing.

     i.   Errors of Commission

         and

     ii.   Errors of Omission

What is the relationship between Equivalence Partitioning and Boundary value analysis?

Under which circumstances is Combinational testing using Truth Tables useful?

One Black Box testing method is known as Error Guessing. Explain *three* typical errors that would be checked for in this test technique. [3 marks]

Give *two* strengths and *two* weaknesses of the Black Box test technique of Random Testing.

Give *one* of the strengths and one of the weaknesses of *one* of the following White-box and Black-box software testing methods:

      i.   Error Guessing
     or
     ii.   Random Testing

What is a control flow graph (CFGs)? Draw sample CFGs illustrating their appearance for a Switch statement and a While loop.

A 'data-flow' approach to testing is a way of looking at a program as a flow of data from one statement to another. The motivation is to find data flow anomalies. Give explanations of three types of anomalies with short examples.

Give one of the strengths and one of the weaknesses of *five* of the following White-box and Black-box software testing methods:

     iii.   Statement Testing
     iv.   Branch Testing
     v.   Path Testing
     vi.   Equivalence Partitioning
     vii.   Boundary Value analysis
     viii.   Combinational Testing/Truth tables/Cause-Effect Graphing

State the difference between Software verification and Software validation in the context of software testing.

Give *three* documents that would be considered as part of a typical Test Plan according to the IEEE model.

Explain two advantages and two problems associated with software testing within the traditional Waterfall software process model.

"The V-model of software development emphasizes the verification and validation of software throughout the development process". With the aid of an appropriate illustration, can you show and describe how this process is carried out at the various test stages from Unit testing through to Acceptance testing?

Discuss the advantages and disadvantages of using the V-model for software development?

The Incremental development model of Software Development is an 'Agile' method. Draw a diagram that illustrates how the Incremental development model works. Give *one* advantage and *one* disadvantage of it.

Draw a diagram of the XP, Extreme Programming, software development process. Ensure to highlight in your diagram the points at which software testing is carried out.

Extreme Programming, also known as XP, is a Software Development model that relies on the use of Story Cards. Explain what they are and create an example of one to illustrate how they might appear.

For the SCRUM approach to managing software development explain the following two terms. Also, sketch a diagram to show their relationship to each other.
    i.   Product Backlog
   ii.   Sprint and Sprint Backlog

Give one advantage and one disadvantage of the DevOps method of Software development. Briefly explain how DevOps differs from other techniques.