(2½ Hours) **[Total Marks: 75]**

N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All

(a) Multiple Choice Questions **(10M)**

I. What is the first step in the software development lifecycle?
   a) System Design
   b) Coding
   c) System Testing
   d) Preliminary Investigation and Analysis

II. Select the people who identify the document and verifies the correctness of the software…
   a) Project manager
   b) SQA team
   c) Project team
   d) All of the mentioned

III. What do QA and QC stand for?
   a) Quality Assurance and Queuing Control
   b) Quality Adjustment and Quality completion
   c) Quality Assurance and Quality control
   d) Quality Adjustment and Queuing control

IV. Which of the following correspond to the two questions 'Are we building the right product?' & 'Are we building the product right?'
   a) Verification only
   b) Validation only
   c) Validation and Verification respectively
   d) Verification and Validation respectively

V. Whose responsibility is Validation?
   a) Developer
   b) Designer
   c) Tester
   d) QA Team

VI Test cases are created in which phase?
   a) Test Specification
   b) Test Planning
   c) Test Requirement
   d) Test Configuration

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VII. What is unit testing?
   a) A Unit is a smallest testable portion of system or application which can be compiled, liked, loaded, and executed.
   b) A Unit testing is a unit wise testing
   c) Means performed on a complete, integrated system.
   d) None of the above

VIII. Quality of the product comes under which type of measures?
   a) Indirect measures
   b) Direct measures
   c) Coding
   d) None of the above.

IX. Which of the following is used as a ISO quality assurance standard that applies to software engineering?
   a) ISO 9000
   b) ISO 9001
   c) ISO 9002
   d) ISO 9003

X. What is Six Sigma?
   a) A Summary Statistics
   b) A representation variations
   c) Permission to improve process
   d) All of the above

(b) Fill in the blanks (prevention cost, number of lines of code ,defect, Static Testing, Market, Inspection) **(5M)**

I. Verification is _____
II. _____ does not affect the software quality and organizational performance.
III. A software _____is a coding fault that results in inaccurate or unexpected outputs from a software program that does not satisfy its intended purpose
IV. In size oriented metrics, metrics are developed based on the _____
V. Quality improvement, Quality education, and Quality performance reporting fall under the category of _____

Q. 2 Attempt the following **(Any THREE)** **(15M)**
(a) What is Quality? Discuss various quality factors in detail.
(b) What is Software review? Explain the types of reviews?
(c) What is testing? Elaborate the objectives of Testing.
(d) What is white box testing? Explain its types in brief.
(e) Draw neat labelled diagram of water fall model and explain it.
(f) Write short note on Inspection and Walkthrough

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Q. 3 Attempt the following **(Any THREE)** **(15M)**

(a) Elaborate the concept of unit testing.
(b) Differentiate between alpha and beta testing.
(c) What is Software metric? Explain the importance of metrics and different types of it.
(d) Explain the cyclomatic complexity measures in software metrics.
(e) Describe the defect management process in detail.
(f) Illustrate function point metrics in detail.

Q. 4 Attempt the following **(Any THREE)** **(15M)**

(a) List and explain the goals and objective of SQA
(b) Why is it important for a software-development organization to obtain ISO-9000 certification?
(c) What is FTR? Explain it in detail.
(d) What is Pareto Diagrams and explain the steps for drawing Pareto chart.
(e) What is Run chart? How to create it?
(f) Explain with example how cost of quality helps in decision making

Q. 5 Attempt the following **(Any FIVE)** **(15M)**

(a) Define the following terms:
  i) Fault
  ii) Error
  iii) Failure
(b) Explain boundary value analysis with an example.
(c) Discuss Integration Testing in brief.
(d) Explain the format of defect report in detail.
(e) List and explain the types of quality cost in brief.
(f) Write short note on Cause-effect Diagrams
(g) Elaborate the process of SQA.
(h) Describe phases of software development life cycle.

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