NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Software Engineering

Assignment- 1

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 10 **Total mark: 10 X 1 = 10**

For each of the following questions one or more of the given options are correct. Choose the correct options.

QUESTION 1:

Which of the following are **not** factors contributing to the software crisis?

a. Larger problems,
b. Poor project management
c. Increased use of Computer-Aided Software Engineering (CASE) tools
d. Lack of adequate training in software engineering
e. Low reliability of the hardware platforms

Correct Answer: c. Increased use of Computer-Aided Software Engineering (CASE) tools
e. Low reliability of the hardware platforms

Detailed Solution:

Increased use of CASE tool and low reliability of the hardware platform are not the factors contributing to software crisis. Please refer to slide 9 of week 1 lecture material.

QUESTION 2:

Which one of the following types of software development most closely resembles the exploratory style of software development?

a. First specify the software, then design the test cases, then develop the software, and keep on modifying it until it passes all the test cases
b. First specify the system, then develop the software, and finally test the developed software
c. First develop the software, and then keep on modifying the software until the customer accepts it
d. Keep on specifying a little, designing a little, and testing a little until the full software is developed
e. Develop a prototype to collect customer feedbacks, then develop the software, and finally test the developed software

Correct Answer: c. First develop the software, and then keep on modifying the software until the customer accepts it

Detailed Solution:

Exploratory style of software development also called build-and-fix style, where the software is first developed and kept on modifying until the customer accepts it. You can refer slide 12 of week 1 lecture material for more information.

QUESTION 3:

Which one of the following statements is **FALSE** about the consequence of developing software by deploying the exploratory style?

a. It is difficult to use exploratory style in team development environment
b. For moderate and large-sized projects, use of exploratory style leads to high cost and project delays
c. When exploratory approach is used to construct toy projects, such as assignments in an introductory programming course, the developed software is invariably of poor quality and also takes an unreasonable amount of time to complete.
d. Development of large projects using the exploratory style, sometimes leads to project failure
e. When large projects are developed using an exploratory style, very high-quality software is frequently produced.

Correct Answer: **e.** When large projects are developed using an exploratory style, very high-quality software is frequently produced.

Detailed Solution:

Very high quality software is difficult to be assured since it often results in unmaintainable code.

QUESTION 4:

Which one of the following is not justified by the magic number 7?

a. Number independent variables in a function should not exceed 7.
b. A function should not call more than 7 functions
c. A function should not be called by more than 7 functions
d. Number of decision statements in a function should not exceed 7.
e. A function should not have more than 7 parameters

Correct Answer: **c.** A function should not be called by more than 7 functions

Detailed Solution:

If a function is called by more than 7 functions, it would be difficult to store the information about all the 7 functions in short term memory.

QUESTION 5:

Which one of the following involves using the *abstraction* principle?

a. Model building
b. Decomposition
c. Modularization
d. Structured programming
e. Functional decomposition

Correct Answer: a. Model building

Detailed Solution:

Abstraction focuses attention on only one aspect of the problem and ignores other aspects and irrelevant details. It is also called model building. Please see slide 29 of week 1 lecture material for more information.

QUESTION 6:

Defects get introduced into a work product due to mistakes committed by the members of the development team. A mistake in an activity pertaining to which one of the following phases is likely to be most expensive to correct when detected during system testing?

a. System testing
b. Design
c. Coding and unit testing
d. Requirements analysis and specification
e. Maintenance

Correct Answer: d. Requirements analysis and specification

Detailed Solution:

Model building is a graphical and written description of the product. Hence, it can be considered as abstraction.

QUESTION 7:

Which of the following are implications of the magical number 7 in build and fix development projects?

a. Development effort increases exponentially with program size
b. Development effort increases linearly with program size
c. Development effort increases sub-linearly with program size
d. Development effort decreases linearly with program size
e. Each module should be decomposed into at least 7 modules in a good design
f. Each module should be decomposed into at most 7 modules in a good design

Correct Answer: a. Development effort increases exponentially with program size
f. Each module should be decomposed into at most 7 modules in a good design

Detailed Solution:

If a person deals with seven or less number of items, these would be accommodated in the short term memory. So, he can easily understand it. On the other hand, as the number of new information increases beyond seven, it becomes exceedingly difficult to understand it.

QUESTION 8:

Which of the following are not implications of severely restricted size of the short–term memory?

a. Difficulty in permanently remembering large amount of information.
b. Difficulty in developing a program with large number of variables
c. Difficulty in debugging a program with large number of variables
d. Difficulty in understanding a program with large number of variables
e. Difficulty in understanding a design in which each module is decomposed into a large number of modules
f. Difficulty in understanding a design in which a function calls a large number of other functions
g. Difficulty in understanding a design in which a function is called by a large number of functions
h. Difficulty in understanding a design in which a module is reused in many modules

Correct Answer: g. Difficulty in understanding a design in which a function is called by a large number of functions
h. Difficulty in understanding a design in which a module is reused in many modules

Detailed Solution:

Short-term memory cannot remember large amount of information. As the number of independent variables in the program increases, it quickly exceeds the grasping power of an individual
Please refer slide no. 17 to 26 of week 1 lecture material for more understanding.

QUESTION 9:

While using the exploratory development style, the effort required to develop a software grows exponentially with the size of the software. Which one of the following is a possible reason behind it?

a. Testing effort increases exponentially
b. Code size becomes exponentially large
c. As the number of independent variables in the program increases, it quickly exceeds the grasping power of an individual.
d. As the size of a program increases, it becomes very difficult to correct compilation errors.
e. As the size of a program increases, program compilation takes an unduly large amount of time.

Correct Answer: c. As the number of independent variables in the program increases, it quickly exceeds the grasping power of an individual.

Detailed Solution:

As the size and complexity of programs increased further, Exploratory programming style proved to be insufficient. For more information, please refer slide 62 of week 1.

QUESTION 10:

Which of the following are not justified by the magic number 7?

a. Number independent variables in a function should not exceed 7.
b. A function should not call more than 7 functions
c. A function should not have more than 7 statements
d. A function should not be called by more than 7 functions
e. Number of decision statements in a function should not exceed 7.

Correct Answer: c. A function should not have more than 7 statements
d. A function should not be called by more than 7 functions

Detailed Solution:

Magic number 7 indicates that more than 7 items can not be remembered in short-term memory. Therefore, more than 7 independent variables in a function, or calling more than 7 functions, more than 7 decision statements in a function make it difficult to remember.

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