

## ### الفصل الأول: Introduction to Software Quality Assurance (SQA)

### #### التلخيص (عربي):

1. **هندسة البرمجيات\*\*:** هي دراسة تفصيلية لتصميم وتطوير وصيانة البرمجيات. تهدف إلى ضمان بناء **\*\***. التطبيقات بشكل صحيح وفي الوقت المحدد ودون تجاوز الميزانية.
2. **نشاطات عملية البرمجيات\*\*:** تشمل أربع نشاطات أساسية **\*\***:
  - مواصفات البرمجيات **\*\***: تحديد ما يجب أن يفعله البرنامج **\*\***.
  - تطوير البرمجيات **\*\***: تصميم وبرمجة البرنامج **\*\***.
  - تحقق البرمجيات **\*\***: التأكد من أن البرنامج يلبي متطلبات العميل **\*\***.
  - تطور البرمجيات **\*\***: تعديل البرنامج ليتلاءم مع المتطلبات المتغيرة **\*\***.
3. **أدوات تساعد في أتمتة عملية تطوير البرمجيات، وتقلل من الوقت والتكلفة مع تحسين **\*\*CASE أدوات** الجودة.**
4. **جودة البرمجيات\*\*:** مدى توافق النظام أو المكون مع متطلبات العميل **\*\***.
5. **مجموعة من الإجراءات المخطط لها لتوفير الثقة بأن عملية تطوير **\*\*SQA** ضمان جودة البرمجيات** البرمجيات تلتزم بالمتطلبات الفنية والإدارية **\*\***.

### #### التلخيص (English):

1. **Software Engineering\*\*:** A detailed study of the design, development, and maintenance of software. It ensures that applications are built correctly, on time, and within budget.
2. **Software Process Activities\*\*:** Four fundamental activities:
  - **Software Specification\*\*:** Defining what the software should do.
  - **Software Development\*\*:** Designing and programming the software.
  - **Software Validation\*\*:** Ensuring the software meets customer requirements.
  - **Software Evolution\*\*:** Modifying the software to reflect changing requirements.
3. **CASE Tools\*\*:** Tools that automate the software development process, reducing time and cost while improving quality.

4. **Software Quality**: The degree to which a system or component meets customer requirements.
5. **Software Quality Assurance (SQA)**: A planned set of actions to ensure the software development process conforms to technical and managerial requirements.

##### أسئلة الاختيار من متعدد:

1. **What is the main goal of Software Engineering?**

- a. To reduce the cost of hardware
- b. To ensure the application is built consistently, correctly, on time, and within budget
- c. To increase the complexity of software
- d. To eliminate the need for testing

**Correct Answer: b**

2. **Which of the following is NOT a fundamental activity in software processes?**

- a. Software Specification
- b. Software Development
- c. Software Marketing
- d. Software Validation

**Correct Answer: c**

3. **What is the purpose of CASE tools?**

- a. To increase the complexity of software
- b. To reduce the time and cost of software development
- c. To eliminate the need for software engineers
- d. To replace software testing

**\*\*Correct Answer: b\*\***

4. **\*\*Which activity ensures that the software meets customer requirements?\*\***

- a. Software Specification
- b. Software Development
- c. Software Validation
- d. Software Evolution

**\*\*Correct Answer: c\*\***

5. **\*\*What does SQA stand for?\*\***

- a. Software Quality Assessment
- b. Software Quality Assurance
- c. Software Quality Analysis
- d. Software Quality Application

**\*\*Correct Answer: b\*\***

6. **\*\*Which of the following is a characteristic of software quality?\*\***

- a. Meeting customer needs and expectations
- b. Increasing the complexity of the software
- c. Reducing the need for documentation
- d. Eliminating the need for testing

**\*\*Correct Answer: a\*\***

7. **\*\*What is the primary focus of Software Evolution?\*\***

- a. Designing new software
- b. Modifying existing software to meet new requirements

- c. Testing the software for errors
- d. Writing documentation for the software

**\*\*Correct Answer: b\*\***

8. **\*\*Which of the following is a benefit of using CASE tools?\*\***

- a. Increased complexity of software
- b. Reduced time and cost of development
- c. Elimination of the need for software engineers
- d. Increased need for manual testing

**\*\*Correct Answer: b\*\***

9. **\*\*What is the main objective of Software Specification?\*\***

- a. To design the software
- b. To define what the software should do
- c. To test the software
- d. To modify the software

**\*\*Correct Answer: b\*\***

10. **\*\*Which of the following is a key activity in Software Development?\*\***

- a. Defining customer requirements
- b. Writing code and designing the software
- c. Testing the software for errors
- d. Modifying the software to meet new requirements

**\*\*Correct Answer: b\*\***

##### أسئلة صح/خطأ:

1. **\*\*Software Engineering ensures that the application is built consistently and correctly.\*\***

- **\*\*True\*\***

2. **\*\*CASE tools are used to increase the complexity of software development.\*\***

- **\*\*False\*\***

3. **\*\*Software Quality Assurance (SQA) is only concerned with technical requirements.\*\***

- **\*\*False\*\***

4. **\*\*Software Evolution involves modifying the software to reflect changing customer requirements.\*\***

- **\*\*True\*\***

5. **\*\*Software Validation is the process of designing and programming the software.\*\***

- **\*\*False\*\***

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### ### الفصل الثاني: Software Quality Factors

#### #### التلخيص (عربي):

1. **\*\*عوامل جودة البرمجيات:\*\*** تصنف المتطلبات إلى 11 عامل جودة، مقسمة إلى ثلاث فئات:

- **\*\*عوامل تشغيل المنتج:\*\*** الصحة، الموثوقية، الكفاءة، السلامة، سهولة الاستخدام.

- **\*\*عوامل مراجعة المنتج:\*\*** القابلية للصيانة، المرونة، القابلية للاختبار.

- عوامل انتقال المنتج \*\*: القابلية للنقل، إعادة الاستخدام، التشغيل البيئي \*\* -
- 2. مدى دقة البرنامج في تنفيذ المهام المطلوبة: \*\* (Correctness) الصحة \*\*
- 3. مدى قدرة البرنامج على العمل دون فشل: \*\* (Reliability) الموثوقية \*\*
- 4. مدى سهولة تصحيح الأخطاء وإضافة تحسينات: \*\* (Maintainability) القابلية للصيانة \*\*

#### التلخيص (English):

1. **Software Quality Factors**: Requirements are classified into 11 quality factors, divided into three categories:
  - **Product Operation Factors**: Correctness, Reliability, Efficiency, Integrity, Usability.
  - **Product Revision Factors**: Maintainability, Flexibility, Testability.
  - **Product Transition Factors**: Portability, Reusability, Interoperability.
2. **Correctness**: The accuracy of the software in performing required tasks.
3. **Reliability**: The ability of the software to operate without failure.
4. **Maintainability**: The ease of correcting errors and making improvements.

#### أسئلة الاختيار من متعدد:

1. **Which of the following is a product operation factor?**
  - a. Maintainability
  - b. Reliability
  - c. Portability
  - d. Reusability

**Correct Answer: b**
2. **What does "Correctness" in software quality refer to?**
  - a. The ability to reuse the software
  - b. The accuracy of the software in performing required tasks

- c. The ease of modifying the software
- d. The ability to transfer the software to different environments

**\*\*Correct Answer: b\*\***

3. **\*\*Which factor deals with the ease of testing the software?\*\***

- a. Flexibility
- b. Testability
- c. Usability
- d. Efficiency

**\*\*Correct Answer: b\*\***

4. **\*\*Which of the following is a product revision factor?\*\***

- a. Correctness
- b. Reliability
- c. Maintainability
- d. Portability

**\*\*Correct Answer: c\*\***

5. **\*\*What does "Reliability" in software quality refer to?\*\***

- a. The ability to operate without failure
- b. The ease of modifying the software
- c. The ability to transfer the software to different environments
- d. The accuracy of the software in performing tasks

**\*\*Correct Answer: a\*\***

6. **\*\*Which factor deals with the ability to reuse software modules?\*\***

- a. Portability
- b. Reusability
- c. Interoperability
- d. Testability

**\*\*Correct Answer: b\*\***

7. **\*\*What is the main focus of "Usability" in software quality?\*\***

- a. The ease of training new employees to use the software
- b. The ability to operate without failure
- c. The accuracy of the software in performing tasks
- d. The ease of modifying the software

**\*\*Correct Answer: a\*\***

8. **\*\*Which factor deals with the ability to adapt software to new environments?\*\***

- a. Portability
- b. Reusability
- c. Interoperability
- d. Testability

**\*\*Correct Answer: a\*\***

9. **\*\*What does "Maintainability" in software quality refer to?\*\***

- a. The ease of correcting errors and making improvements
- b. The ability to operate without failure
- c. The accuracy of the software in performing tasks
- d. The ability to transfer the software to different environments

**\*\*Correct Answer: a\*\***



10. \*\*Which of the following is a product transition factor?\*\*

- a. Correctness
- b. Reliability
- c. Portability
- d. Efficiency

\*\*Correct Answer: c\*\*

#### أسئلة صح/خطأ:

1. \*\*Reliability refers to the ability of the software to perform without failure.\*\*

- \*\*True\*\*

2. \*\*Maintainability is a product transition factor.\*\*

- \*\*False\*\*

3. \*\*Usability deals with the ease of training new employees to use the software.\*\*

- \*\*True\*\*

4. \*\*Testability is a product operation factor.\*\*

- \*\*False\*\*

5. \*\*Portability refers to the ability to adapt software to new environments.\*\*

- \*\*True\*\*

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### ### الفصل الثالث: Components of SQA System

#### #### التلخيص (عربي):

1. تشمل ستة فئات: **SQA** مكونات نظام:
  - مكونات ما قبل المشروع: مراجعة العقود، خطط التطوير والجودة.
  - مكونات دورة حياة المشروع: المراجعات، اختبار البرمجيات، صيانة البرمجيات.
  - مكونات البنية التحتية: التدريب، الإجراءات الوقائية، إدارة التكوين.
  - مكونات إدارة الجودة: التحكم في التقدم، مقاييس الجودة.
  - **SQA**، تقييم نظام **ISO** المعايير والتقييم: معايير.
  - ، وحدات الاختبار **SQA** التنظيم: إدارة.
2. مراجعة العقود: يتم مراجعة متطلبات العميل والجدول الزمني والميزانية قبل بدء المشروع.
3. اختبار البرمجيات: يتم اختبار البرمجيات لاكتشاف الأخطاء والتأكد من أنها تلبى المتطلبات.

#### #### التلخيص (English):

1. **Components of SQA System**: Six categories:
  - **Pre-Project Components**: Contract review, development and quality plans.
  - **Project Life Cycle Components**: Reviews, software testing, maintenance.
  - **Infrastructure Components**: Training, preventive actions, configuration management.
  - **Quality Management Components**: Progress control, quality metrics.
  - **Standards and Assessment**: ISO standards, SQA system assessment.
  - **Organizational Components**: SQA management, testing units.
2. **Contract Review**: Reviewing customer requirements, schedule, and budget before starting the project.
3. **Software Testing**: Testing the software to detect faults and ensure requirements are met.

##### أسئلة الاختيار من متعدد:

1. **\*\*Which of the following is a pre-project component of SQA?\*\***

- a. Software Testing
- b. Contract Review
- c. Configuration Management
- d. Staff Training

**\*\*Correct Answer: b\*\***

2. **\*\*What is the main objective of software testing?\*\***

- a. To increase the complexity of the software
- b. To detect software faults and ensure requirements are met
- c. To eliminate the need for maintenance
- d. To reduce the cost of hardware

**\*\*Correct Answer: b\*\***

3. **\*\*Which component deals with the adaptation of software to new environments?\*\***

- a. Maintainability
- b. Portability
- c. Flexibility
- d. Testability

**\*\*Correct Answer: b\*\***

4. **\*\*Which of the following is a project life cycle component?\*\***

- a. Contract Review
- b. Software Testing

- c. Staff Training
- d. Configuration Management

**\*\*Correct Answer: b\*\***

5. **\*\*What is the purpose of configuration management?\*\***

- a. To increase the complexity of the software
- b. To control changes to the software and ensure consistency
- c. To eliminate the need for testing
- d. To reduce the cost of hardware

**\*\*Correct Answer: b\*\***

6. **\*\*Which of the following is an infrastructure component of SQA?\*\***

- a. Contract Review
- b. Software Testing
- c. Staff Training
- d. Progress Control

**\*\*Correct Answer: c\*\***

7. **\*\*What is the main focus of quality management components?\*\***

- a. To detect software faults
- b. To control project progress and ensure quality
- c. To eliminate the need for maintenance
- d. To reduce the cost of hardware

**\*\*Correct Answer: b\*\***

8. **\*\*Which of the following is a standard used in SQA?\*\***

- a. ISO 9001
- b. IEEE 1012
- c. Both a and b
- d. None of the above

**\*\*Correct Answer: c\*\***

9. **\*\*What is the role of the SQA unit?\*\***

- a. To develop and support SQA components
- b. To detect deviations from SQA procedures
- c. To suggest improvements to SQA components
- d. All of the above

**\*\*Correct Answer: d\*\***

10. **\*\*Which of the following is a key activity in contract review?\*\***

- a. Defining customer requirements
- b. Reviewing the project schedule and budget
- c. Testing the software for errors
- d. Modifying the software to meet new requirements

**\*\*Correct Answer: b\*\***

#### أسئلة صح/خطأ:

1. **\*\*Contract review is conducted after the project has started.\*\***

- **\*\*False\*\***

2. **\*\*Software testing is only performed by the project team.\*\***

- **\*\*False\*\***

3. **Configuration management ensures that changes to the software are recorded and controlled.**

- **True**

4. **Staff training is an infrastructure component of SQA.**

- **True**

5. **The SQA unit is responsible for developing and supporting SQA components.**

- **True**