

Chapter 1 (Introduction)

Q.1 Define Software. What are the attributes of good software? Is any factors to fail it?

Software: Software is a computer programs and associated documentation that may be developed for a particular customer or may be developed for a general market.

A Good software have some attributes. It should;

- Deliver the required functionality and performance
- Be maintainable
- Be dependable
- Be efficient
- Be acceptable and usable

There are still many reports of software projects going wrong and ‘software failures’.

There are two factors:

- ***Increasing demands:*** As new software engineering techniques help us to build larger, more complex systems, the demands change. Sometimes it is impossible to build and delivered large, more complex, increasing demand more quickly.
- ***Failure to use software engineering methods (Expectations):*** It is fairly easy to write computer programs without using software engineering methods and techniques. Many companies do not use software engineering methods in their everyday work. Consequently, their software is often more expensive and less reliable than it should be.

Q2. What is software engineering? What are the fundamental software engineering activities?

Software Engineering: Software engineering is an engineering that is concerned with all aspects of software production. The fundamental activities of software engineering are;

- Software specification
- Software development,
- Software validation and
- Software evolution

Q3. What is the most important difference between generic software product development and custom software development?

Generic products is a stand-alone systems that are marketed and sold to any customer who wishes to buy them. For examples – PC software, CAD software.

And **Customized products** is a software that is commissioned by a specific customer to meet their own needs. For examples – embedded control systems.

An important difference between these types of software is that, in generic products, the organization that develops the software controls the software specification. For custom products, the specification is usually developed and controlled by the organization that is buying the software.

Q4. What is software engineering? Explain the application of it.

Software engineering: It is an engineering discipline that is concerned with all aspects of software production from the early stages of system specification through to maintaining the system after it has gone into use.

Application: There are several types of application;

- **Stand-alone applications:** These are application systems that run on a local computer, such as a PC. They include all necessary functionality and do not need to be connected to a network.
- **Interactive transaction-based applications:** Applications that execute on a remote computer and are accessed by users own PCs or terminals. These include web applications such as e-commerce applications.
- **Embedded control systems:** Software that control & manage hardware devices.
- **Batch processing systems:** These are business systems that are designed to process data in large batches. They process large numbers of inputs to create corresponding outputs.
- **Entertainment systems:** Primarily for personal use then intended the user.
- **Systems for modelling and simulation:** These are systems that are developed by scientists and engineers.
- **Data collection systems:** These are systems that collect data from their environment using a set of sensors and send that data to other systems.

Q5. What are the four important attributes that all professional software should have?

There are four important responsibility to develop a professional software that referred to as professional ethics. These are;

- ***Confidentiality***: Engineers should normally respect the confidentiality of their employers or clients irrespective of whether or not a formal confidentiality agreement has been signed.
- ***Competence***: Engineers should not misrepresent their level of competence. They should not accept work which is out with their competence.
- ***Intellectual property rights***: Engineers should be aware of local laws governing the use of intellectual property. They should be careful to ensure that the intellectual property of employers and clients is protected.
- ***Computer misuse***: Software engineers should not use their technical skills to misuse other people's computers.

Q6. What is ACM/IEEE Code of Ethics?

The Code contains eight Principles related to the behaviour of and decisions made by professional software engineers, including practitioners, educators, managers, supervisors and policy makers, as well as trainees and students of the profession.

Q7. What Software engineering diversity say?

There are many different types of software system and there is no universal set of software techniques that is applicable to all of these.

Q8. What is the difference between software engineering and computer science?

Computer science focuses on theory and fundamentals; software engineering is concerned with the practicalities of developing and delivering useful software.

Q9. What is the difference between software engineering and system engineering?

System engineering is concerned with all aspects of computer-based systems development including hardware, software and process engineering. Software engineering is part of this more general process.

Q10. What are the key challenges facing software engineering?

Coping with increasing diversity, demands for reduced delivery times and developing trustworthy software.

Q11. What are the requirements of software cost?

Software costs often dominate computer system costs. The costs of software

- On PC are often greater than the hardware cost.
- Is more to maintain than develop
- Is concerned with cost-effective software development.