Assignment Answers:

1. What are the main reasons for the emergence of software testing?

- Programs were starting to get larger, and the tools, techniques, and processes were not improving fast enough.
- Projects were running over budget and over time.
- Inefficient and low-quality software.
- Software most often did not meet the requirements of the customers.
- Projects were unmanageable, and codes were unmaintainable.
- Some Software was never delivered.

2. What does software testing mean? And how it's related to quality management?

There are many definitions of software testing, and it can be viewed in many
ways. However, in essence, software testing is the systematic hunting of errors and the process of evaluating whether the software works as it should.
Quality management consists of both quality assurance and quality control. Software Testing is part of both phases, but it is mainly present in the second part, the quality control (e.g., usability testing).

3. Why is software testing considered to be an important part of software development? and what aspects could affect/limit the testing process?

Software testing can help in saving costs. For example, the cost of a fault discovered in the production phase is 100 times greater than the cost of a mistake found in the analysis phase. Other than that, testing can help deliver the software within the specifications of the customer. However, due to financial restraints, time, human resources, and other resources. It is difficult to perform testing at all the steps of production.

4. What are the benefits of software testing?

- Faults can be found through testing.
- Gives an estimate of the quality of the product.
- Produces data/ information to improve the product further
- Produces data/ information to improve the organization's work process.
- Eases the development of software by pinpointing problems and weak parts.
- Testing is a value-adding component of the software project, not an expense.

5. At what stage of the software development process the NASA Mars climate orbiter failure could have been avoided? explain your answer.

We can argue different answers here, but I wouldn't say that this could have been avoided during the testing phase. Because the software did what it was supposed to do according to specifications correctly. I would argue that this is a bug in the specification and planning process. In short, there was a miscommunication between the engineers in NASA and Lockheed Martin. If the specifications have stated, the unit system that should have been used then this bug could have been avoided.