Questions:

**1.** a) In his seminal paper ‘No Silver Bullet, Essence and Accidents of Software Engineering’, published in 1986, Brooks discusses ‘accidental’ and ‘essential’ difficulties in software engineering. According to Brooks what are the Essential and Accidental difficulties of software engineering? Give examples where possible.

[12 marks]

b) Critically discuss the advantages and disadvantages of eXtreme Programming.

[15 Marks]

c) Critically discuss the use of standards in software development listing the advantages and disadvantages of standards.

[8 Marks]

d) The SEI Capability Maturity Model (CMM) is composed of five levels, Initial/Performed, Repeatable, Defined, Managed and Optimizing. Discuss THREE levels from the SEI CMM clearly stating their characteristics, key process areas and key challenges.

[15 Marks]

**2.** a) There are four principle methods for dealing with risk, Reduction, Avoidance, Transfer or Retention. Assume that you are planning a software iteration and that you are considering various use-case for inclusion in the next iteration. How would you approach managing risk?

[10 Marks]

b) The following risks have been identified during a design iteration of a software development:

1. feature creep has a probability of occurrence of 1/3 and an impact of 3 weeks,

2. loss of key staff has a probability of occurrence of 0.4 and an impact of 6 weeks,

3. customer availability has a probability of occurrence of 0.5 and an impact of 4 weeks,

4. hardware delays has a probability of occurrence of 0.2 and an impact of 10 weeks,

You are the risk manager for the project and are trying to prioritize these risks

Calculate exposure and prioritize the above risks.

[8 marks]

c) You are writing a briefing document for your manager detailing the key activities involved with project planning. Your document contains the following headings:

• Partitioning the project into tasks

• Quantifying these tasks

• Identifying the dependencies between tasks

• Preparing a preliminary schedule

• Balancing resources

Discuss each of these activities and in doing so describe why they are important and how they can be achieved.

[20 Marks]

d) You have been approached to develop engine control software for a fleet of passenger ferry. Select and justify a methodology for the software development. Clearly state the key characteristics of the methodology that define its suitability for this type of software

[12 Marks]

**3**. a) Contemporary software engineering techniques offer many promises. Critically evaluate either NO-SQL database or TOGAF in the context of software engineering. You answer should ONLY evaluate one of the techniques.

[30 marks]

b) The British Computer Society (BCS) code of conduct is divided into the following four sections, Public Interest, Duty to Relevant Authority, Duty to the Profession and Professional Competence and Integrity.

Explain each of the four sections of the BCS code of conduct with an appropriate example. Your answer should also explain why they are important for software engineering.

[20 Marks]