Answer three questions.

1. Engineering activities all seem to have a 'process' — a procedure or set of procedures for people undertaking the engineering activity to follow.

   a. What are the arguments for and against having a 'process'?

   [10 marks]

   b. Software Engineering seems to abound with 'process models'. Compare and contrast, with emphasis on applicability, the major ones.

   [23 marks]

   [Total 33 marks]

2. You are a technical manager in a systems development organisation that provides telephone services software, i.e. the software that works telephone exchanges and PABXs and also the account management software. It has been decided that resource must be put into completely re-vamping the customer services (e.g. number enquiries, fault reporting, call redirect, call waiting, itemized billing, etc.) supported by the systems. The directors want to hold a meeting in 45 minutes to set everything in motion. They have asked you to present a brief technical paper outlining a vision of what might be the services on offer and a rough sketch of the architecture and behaviour of such a system.

   Write the paper that you would present.

   [Total 33 marks]

3. a. Explain the notion of a *virtual machine*.

[5 marks]

b. What are the layers of virtual machine used in describing a computer system?

[5 marks]

c. What are the types of notations that are used in computer-based system development? Choosing examples from each type, briefly explain the basic components and explain the purpose and use of each of the notations.

[10 marks]

d. What is the relationship between virtual machine, notation, instruction set, and model.

[7 marks]

e. How do the ideas of virtual machine etc. relate to abstraction and application development?

[6 marks]

[Total 33 marks]

4. The following 11 terms (in no particular order) are often used in Software Engineering. Give brief explanations of each of them:

requirements capture; analysis; revision control; software assets; architecture; deliverable; task; code; maintenance; application; imperative.

[Each term 3 marks]

[Total 33 marks]

5. a. Object-oriented approaches to system development are becoming popular. What are the concepts that these approaches introduce that are new and how do they affect system development.

[20 marks]

b. Do you feel object-oriented approaches are a good thing? Explain your answer.

[13 marks]

[Total 33 marks]

END OF PAPER