INSTRUCTIONS TO CANDIDATES

Answer any TWO questions.
All questions carry equal weight.

This is an OPEN BOOK examination.
You may consult any books or other documents during this examination.
1. Taking account of the subsequent questions, choose any two large scale software projects you are familiar with:

(a) Provide a brief description of each project. This should focus on the aspects of the projects you will discuss in your answers below. [7 marks]

(b) Choose three aspects of the Software Architecture Process and Management of the projects and provide for each of the aspects:

i. A brief outline of the approach taken to the aspect by your chosen two projects. [6 marks]

ii. A comparison of the approach taken to the aspect by your chosen two projects. [6 marks]

iii. Justification of which you feel was the more successful approach between your two projects. [6 marks]
2. You have been asked to develop the architecture for a system that keeps track of sensor data coming from houses occupied by old people in need of some support to live independently. The system has three broad sets of users: older people who experience interventions initiated in response to their behaviour in the house, call centre workers that monitor data from many houses responding to alerts generated by the system; emergency workers that attend to the older people if directed to by the call centre. The call centre workers can pass on relevant information to the emergency workers as they see fit in order to let the emergency workers respond appropriately.

(a) Suggest an architectural pattern that is a good match for this system. You should justify your answer by pointing out two or three features that are well matched with your chosen pattern. [6 marks]

(b) Suggest an architectural pattern that is a poor match for this system. You should justify your answer by pointing out two or three features that are poorly matched with your chosen pattern. [6 marks]

(c) Provide a diagram of your high level architecture with a brief description of the role of each component. [5 marks]

(d) The company providing the service has decided that privacy and security are important issues in the selling of the system. Purchasers of the system are concerned about what information is passed around and who has access to the information under what circumstances. Suggest how the architecture of the system might have to change to take account of this need, pointing out the changes and justifying that the changes meet the requirements of the purchasers. [8 marks]
3. You are working in a company that produces Enterprise Resource Planning software. This is a large, complex, highly configurable system that controls resource management in organisations that purchase the product. Currently the product is licensed to customers who run the system on their own servers. The company is reviewing its approach to protecting their products from theft and copying since they are planning to open up a new market where product theft is more common. You have been asked to prepare a short summary for decision makers in the company on approaches to the protection of software products. To answer this question you should use your knowledge of Software Architecture Process and Management to provide a draft of the report, covering:

(a) two or more alternative approaches to protecting the product from theft; [6 marks]
(b) the strengths and weaknesses of the approaches you have identified; [8 marks]
(c) the implications for the architecture of the system for each of your alternatives. You should identify what requirements your chosen approaches place on the architecture of the system; [7 marks]
(d) of the approaches you have identified choose one that you think is best suited to the new market providing some assessment of the amount of change your approach would require in order to implement it. [4 marks]