2005 Paper 12 Question 4

Distributed Systems

An appropriate structure for large-scale distributed systems is as multiple, independently administered, firewall-protected, domains. Examples are a national health service, a national police service and a global company with worldwide branches. Communication must be supported within and between domains and external services may be accessed. For example, health service domains may all access a national Electronic Health Record service; police service domains may all access a national Vehicle Licensing service.

(*a*) (*i*) Define publish/subscribe communication.   [3 marks]

    (*ii*) What are the advantages and disadvantages of offering publish/subscribe as the only communication service?   [7 marks]

(*b*) (*i*) Define rôle-based access control.   [3 marks]

    (*ii*) What are the advantages and disadvantages of using rôle names for access control and communication?   [7 marks]

Illustrate your discussions by means of examples.