Section B

Question 4 (a) List 5 factors that are likely to affect a company's future business. [5]

(b) Describe, with the aid of diagrams, three basic common Wide Area Network topologies that designers could employ to connect 4 nodes. What are the advantages and disadvantages of each topology? [9]

(c) Briefly describe the five perceived models of client server systems. [5]

(d) Describe what happens at both the client and the server when a remote procedure call is executed. [6]

Question 5 (a) Explain briefly what the Simple Network Management Protocol (SNMP) is and what convenience it provides for network managers. [6]

(b) Trouble tickets are an important tool for managing problems and faults. Identify 6 fields that you would expect to be completed in a trouble ticket. [6]

(c) What is meant by the term Mean Time Between Failures (MTBF) and what, in one word, what does it actually measure? [2]

(d) A 64 kbit/s private circuit between two offices has a specified MTBF of 1.25 years. It is maintained by a telecommunications company that has a Mean Time To Diagnose (MTTD) of 1 hour, a Mean Time To Respond (MTTResp) of 6 hours and a Mean Time To Fix (MTTF) of 10 hours. What is the expected total downtime of the circuit over a five year period? [4/8]

Use this figure to calculate the expected percentage availability of the circuit using the formula:

$$\%\text{Availability} = \frac{\text{Total uptime} * 100}{\text{Total uptime} + \text{Total downtime}}$$ [4/8]

Assume that 1 year = 365.25 days.

If you do not have a calculator, present you answer as a fraction. You can still obtain maximum marks.

(e) The circuit was actually down for a total of 5 hours last year, but the measurement of the availability of communications between the two offices, as measured by the network management system was 100%. Provide three possible explanations as to why this might be. [3]

Question 6 (a) Describe what a virus is and the threats that they pose. Describe what an organisation can do to minimise the risks. [6]

(b) Describe three different methods that an organisation can employ to authenticate a user accessing its systems. Comment on their strengths and weaknesses and give an example of each. [9]

(c) Describe the purpose of a disaster recovery plan. [2]

(d) What is meant by response time? What factors affect it? Why is it important to minimise it? [5]

(e) Describe three things that a network designer could do to improve response times? [3]