4) You have been asked to design a network installation for a organisation to support approximately 50 users and provide internal and external connectivity and applications.

a) Explain the purpose of the following network components and suggest whether each component is necessary or optional.

i)	SMTP Server	*(4 marks)*
ii)	Domain Name Server	*(4 marks)*
iii)	POP3 Server	*(4 marks)*
iv)	Caching Web Proxy Server	*(4 marks)*

b) The organisation wishes to ensure security of its internal e-mail messages. Explain what Message Integrity Protocols can ensure and give an example of such a protocol.

(5 marks)

c) The organisation has a requirement to store a large number of photographic images. Explain the benefits and problems of storing such images in JPEG format and explain how JPEG compression is achieved.

(12 marks)

5)

    a) In a computer network, what is the purpose of a "Firewall"? Explain what protection firewalls can provide to networks and show some of the vulnerabilities that still exist in a firewalled network..

(9 marks)

    b) Define each of the following terms and show how and why these techniques can be used to provide network security.

        i)   Network Address Translation   *(4 marks)*

        ii)   Proxy Servers   *(4 marks)*

        iii)   Virtual Private Networks   *(4 marks)*

    c) What is the purpose of the following standards, used in network application communications.

        iv)   HTTP   *(2 marks)*

        v)   MIME   *(2 marks)*

        vi)   HTML   *(2 marks)*

    d) Describe carefully how the three standards listed in part c work together to deliver a web page from a server to a browser.

(6 marks)