Digital Communication I

(a) For each of these examples of addressing, state whether it is flat or hierarchical and why:

(i) postal;

(ii) telephone;

(iii) Ethernet (MAC) address;

(iv) Internet (IP) address. [4 marks]

(b) Compare class-based and classless addresses as used in the Internet. [4 marks]

(c) Why were classless addresses introduced? [1 mark]

(d) Consider a router of IP packets.

(i) What information must be held in a routing-table when classless addresses are used? [3 marks]

(ii) Describe Longest-Prefix Match, providing an example of its use. [3 marks]

(iii) Describe the process of routing-table lookup that leads to the default-route being used and comment on the circumstance in which an IP router does not have a default-route. [3 marks]

(e) Considering your answers to part (d), describe two challenges for router-vendors following the introduction of classless addressing. [2 marks]