

2008 Paper 6 Question 3

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]