Question	Answer	Marks
6	**One** mark for each correct benefit **(Max 2)** • Accuracy – Ensures accurate delivery of the message • Completeness – Missing packets can be easily detected and a re-send request sent so the message arrives complete • Resilience – if a network changes the router can detect this and send the data another way to ensure it arrives • Path also available to other users // Doesn't use whole bandwidth // allows simultaneous use of channel by multiple users • Better security as packets hashed and sent by different routes. **One** mark for each correct drawback **(Max 2)** • Time delays to correct errors // Network problems may introduce errors in packets • Requires complex protocols for delivery • Unsuitable for real time transmission applications	**4**

Question	Answer	Marks
6(a)	**One** mark for each correct marking point **(Max 5)** • A large message is divided up into a group of smaller chunks of the same size called **packets** • The packet has a header and a payload • The header contains a source **IP** address, destination **IP** address (and sequence number) • Each packet is dispatched independently • … and may travel along different routes / paths • The packets may arrive out of order • … and are reassembled into the original message at the destination • If packets are missing / corrupted a re-transmission request is sent.	**5**
6(b)	**One** mark for each correct marking point **(Max 3)** • The router examines the packet's header • It reads the IP address of the destination (from the packet header) • A router has access to a routing table • …containing information about, e.g., available hops / netmask / gateway used • … and the status of the routes along the route • … the router decides on the next hop / best route • … and sends the packet on its next hop.	**3**

Question	Answer	Marks
3	Circuit switching max **four** marks Any **two** from • a dedicated circuit • circuit is established before transmission starts // circuit is released after transmission ends • data is transferred using the whole bandwidth • all data is transferred over the same route **Two** from • Advantage – data /frames arrive in order and do not need to be reassembled • Disadvantage – nobody else can use the same circuit even if it is idle //less secure as only one route used Packet switching max **four** marks Any **two** from • data is split into packets • each packet is given its own route • the routing for a packet depends on the congestion • packets may not arrive in the order sent **Two** from • Advantage – packets can be rerouted if there are problems// more secure as harder to intercept messages • Disadvantage – time taken to reassemble packets at the destination	**8**

Question	Answer	Marks
2	**One** mark for each point (**Max 3**) MP1 The Transport Layer breaks data into manageable packets / performs segmentation MP2 It sequences the packets // adds data to the packet header // adds a **packet header** MP3 It sends the packets to the Internet / Network Layer // It receives data from the Application Layer MP4 It controls the flow of packets MP5 It handles packet loss/corruption // Acknowledges receipt of complete error free packets **One** mark for each point (**Max 3**) MP6 The Internet Layer identifies the intended network and host MP7 It transmits packets to the (Data) Link / Physical Layer MP8 It routes the packets independently through the **optimum** route MP9 It addresses packets with their source and destination IP addresses MP10 It then uses an IP address and port number to form a socket.	**5**