

Paper 2B

	Marks
1. (a) data transmission rate/bandwidth, transmission frequency, MIMO, number of channels. ✗ transmission distance, maximum number of users	1×2
(b) (i) Identify a wireless network from the others.	1
(ii) It avoids confusion with other wireless networks. / Travellers cannot identify the desired network. / Security issue – for example, using default SSID will let hacker try using default passwords to get access to the wireless network.	1
(iii) Travellers can shift the connection from one access point to another seamlessly when they move. / The connection is shifted from an access point with a weak signal to an access point with strong signal of the same SSID.	1
(c) (i) The airport does not need to distribute usernames and passwords. (simple operation) Less setup time is needed. (setup) Travellers can use the network immediately. (ease of use) The overall time (✗ rate, speed) for transmission can be shorter as no decryption time is needed	1×2
(ii) WEP has lower security. ✗ WEP is an outdated technology.	1
(iii) Data contents in Network 2 are encrypted. / They have different protocols. / It is faster to transmit data in Network 1 as no decryption is needed.	1
(d) (i) It is because collisions cannot be detected in the wireless environment.	1
(ii) Immediately after a node receives a packet, the CSMA/CA protocol ensures that the transmission channel is clear, i.e. no other node is transmitting at the moment. If the channel is clear, the packet will be sent. Otherwise, the node will need to wait for a random period of time for resending.	1 1
(e) Use SSID names different from that in the airport. Use WPA2 to avoid hacker attack. Require passwords for network connection to limit the access. Adjust channel to avoid interference. ✗ disclaimer	1×2

	Marks
2. (a) (i) The data is not up-to-date. / There is a delay.	1
(ii) Processing power, network stability, network availability	1×2
(b) (i) It is faster to set up the database server.	1
(ii) The backup may be destroyed with the database in a disaster (such as fire).	1
(iii) It could be magnetic tape / hard disk because it can provide larger storage capacity.	1+1
(c) (i) Use a firewall with configured access control list to control inbound and outbound communication.	2*
(ii) Use RAID1 / RAID5 to allow recovery of data when a hard disk fails.	2*
(iii) Connect the NAS device with an uninterruptible power supply so as to provide the NAS sufficient power to shut down itself gracefully during power interruption.	2*
(d) Advantage: The workload due to protecting data loss is minimised. / It is easier to access the files outside.	1
Disadvantage: The security control is lower. / More work on monitoring the network traffic may be necessary.	1
3. (a) (i) 210.0.205.237	1
(ii) Connect to an Intranet. (devices to the gateway)	1
(b) (i) 1 router: 1 G / 15M = 66 students 2 routers: 2 × 66 = 132 students	2
(ii) There are overheads for the network connection. / Some students may use multiple devices.	1
(iii) Reasons regarding signal strength (coverage) / backup / redundancy / load balancing	1×2
(c) (i) The student is not required to set up the network manually. (simple setup)	1
(ii) (1) different (2) same (3) same (4) same	1×4
(iii) The gateway refers to the networking device connecting to different subnets and the Internet (WAN).	1
× simply mention router functions	
(d) (i) Two ethical practices from different categories (e.g. inappropriate language, gambling and hacking)	1×2
(ii) Two guidelines from different scopes (e.g. User acknowledgement, security of your mobile device and risks/liabilities of the use)	1×2

		Marks
4. (a)	Advantages: There is more access control. (security) It has better data traffic management.	1×2
	Disadvantages: The hardware cost is higher. The network management work is more complicated.	1×2
(b) (i)	No, it is because there are at most 127 IP addresses in each subnet, which is not suitable for the students' subnet.	1 1
(b) (ii)	Paul can use 192.0.1.1 and 192.0.2.1 to set up the communications between the two subnets such that they can send and receive data through the gateways. (trust rule)	2*
(c) (i)	The web server is out of order. The reply is blocked by a firewall or by a NAT device. The DNS is out of order. There is network congestion. There are packet filtering routing errors.	1×2
(c) (ii)	Use other ports (web browsing) Use other utilities (e.g. tracert)	1 1
(d)	Agree. PING can be used to access web servers. Hackers could control infected computers to issue a tremendous number of accesses to a web server by using PING, leading to a denial-of-service (DoS) attack.	2*

* Marking criteria

- ② Illustrate a comprehensive and logical answer
- ① Illustrate a relevant answer