THE HONG KONG ASSOCIATION FOR COMPUTER EDUCATION

INFORMATION AND COMMUNICATION TECHNOLOGY
MOCK EXAMINATION 2018

PAPER 2 (B)

MARKING SCHEME

1	(a)	(i)	GPS	1
		(ii)	Bus driving in the tunnel cannot use GPS positioning. [Cannot receive GPS signal]	1
			High-rise buildings on the bus routes lurk buses that could not receive GPS signals, causing positioning errors. [GPS signal reception is disturbed]	1
		(iii)	Simplex	1
			because the system only needs to receive the GPS location of the bus, the system can inform the passengers that it does not need to send any information to the bus.	1
	(b)	(i)	Non-encrypted communication	1
			because this connection does not involve sensitive information, and login Wi-Fi can not need to enter the password.	1
		(ii)	Encrypted connection	1
			because this connection involves sensitive personal information, the information transmitted should be encrypted before transmission.	1
		(iii)	Hypertext Transfer Protocol Secure (HTTPS)	1
			HTTPS only provides connection data encryption between the computer and an Internet Banking, and "Encryption Connection" encrypts all data communications externally to the computer before transmission.	1
		(iv)	Wi-Fi on the bus is shared, so failed to reach that speed.	1
			Because buses are driving, reception is poor in some places and the bandwidth speed is worse.	1
		(v)	It is recommended to connect to this frequency band of 5GHz	1
			because many wireless products, including Bluetooth, use the 2.4GHz band, so there is a higher chance of interference on the connection.	1

2	(a)	Test Specifications - Identify the actual and expected output for each test case, and all steps required	1,1
		Test Report - Record the events that occurred during the test and summarize the test activities	1,1
	(b)	The "Performance Test" is used to test whether the network can achieve the expected function / performance.	1
		For example, whether each computer can achieve the highest data transmission speed, say 1Gbps, when 40 students are using the network in the computer room at the same time.	1
	(c)	User Acceptance Test (UAT):	1
		to verify the network can meets the user's requirements (Teachers, students, school staff)	1
	(d)	(i) a security copy which contains only those files which have been altered since the last full and incremental backups.	1
		(ii) First of all, retrieve the backup of last Wednesday,	1
		then retrieve the backup of Thursday, Friday and Saturday in sequence.	1
	(e)	(i) Fast reads; data can be accessed even one of the drive is failed; inexpensive fault tolerance	1
		(ii) Fault tolerance with easy recovery (simply copy the contents of one drive to another)	1
		(iii) Support: RAID cannot retrieve the lost data Against: the fault tolerance of the system can be enhanced, system termination is not required if RAID is used in certain situation.	2

3	(a)	The power of a smartwatch is limited, and the power consumption of Bluetooth is lower.		1
		The distance covered by Bluetooth is shorter and have a better security.		1
		(any other reasonable answers)		
	(b)	(i) Time		
		$= \frac{100\times30\times1024\times8}{25\times1000\times1000}$		1
		= 0.98304 s		1
		(ii) Time delay		
		$= \frac{400\times8}{25\times1000\times1000}$		1
		=0.000128 s		1
3	(c)	(i) CAT 6/6a/7		1
		(ii) Monitoring whether all APs are working normally		1,1
		/ Applying same configurations to several AP		
		/ Monitoring the network flow of the wireless network		
		(any two)		
		(any other reasonable answers)		
		(iii) The number of APs / range of coverage allows all positions in the library		1,1
		can connect the network /		
		All AP's configurations should be the same, e.g. same SSID1		
		/ Turn on the roaming function of Aps		
		(any two)		
		(any other reasonable answers)		
	(d)	(i) Verifying the checksum field in the header of the segment.		1
		(ii) Check the acknowledgement (ACK) number in the header.		1
		If not receiving the ACK number from the destination,		1
		the sender knows the segment cannot be received.		
		(iii) TCP will transmit a special segment that requests the sender to resend the lost segment		1
		(iv) Connect a switch / repeater between AP1 and AP controller using twist pair cables		1

4 (a) Router 1

(b) (i) leakage or loss of important data by hackers / Denial of Service of servers 1
(any possible answers)

(ii) blocked / allowed IP address / domain / domain keywords 1
blocked / allowed port numbers 1

(c) (i)

	Department A	Department B
Maximum range of IP addresses	From 192.168.1.0 (1) to 192.168.1.63 (1)	From 192.168.1.64 (1) to 192.168.1.127 (1)
Subnet mask	255.255.255.192	

(accept the following answers)

	Department A	Department B
Maximum range of IP addresses	From 192.168.1.1 (1) to 192.168.1.62 (1)	From 192.168.1.65 (1) to 192.168.1.126 (1)
Subnet mask	255.255.255.192	

(ii) 64 – 2 = 62 1
192.168.1.0 represents the whole subnet. 192.168.1.63 is the broadcasting address. 1

4 (iv) (i) Password should consist of letters, digits and symbols / the length of password 1
Cannot reuse old passwords 1
(Any other possible answers)

(ii) Higher chance for users to write down the password on paper. 1
Higher chance for users to use simple combinations to construct their passwords. 1