Cambridge International AS & A Level

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Cambridge International Advanced Subsidiary and Advanced Level

INFORMATION TECHNOLOGY **9626/32**

Paper 3 Advanced Theory **May/June 2017**

MARK SCHEME

Maximum Mark: 90

Published

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Question	Answer	Marks
1(a)(i)	***Two*** *from:* Simultaneous two-way video and audio communications With two or more participants/locations Using telecommunications networks Via the internet.	**2**
1(a)(ii)	Use of IT systems/telecommunication systems To work remotely/from home/away from central office	**2**
1(b)	***Five*** *from:* Increased costs of providing/maintaining computer equipment and telecommunication links for the teleworkers More difficult to manage the teleworkers so unable to e.g. Motivate/guide them More difficult to monitor the performance of the teleworkers so cannot check on work rate/targets so easily Cannot manage the times/hours of the working environment of teleworkers so cannot tell when they are working Cannot manage the health/safety aspects of the working environment of teleworkers so may be liable for unknown risks Increased security risk to the data/information that is used by/sent to/from teleworkers so must set up secure links/encryption systems Working in different time zones from company/other employees may cause difficulties Some types of work/tasks are unsuitable for teleworking.	**5**

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Question	Answer	Marks
2(a)	***Eight*** *from:* *Advantages:* A firewall can provide protection to multiple networked computers simultaneously Firewalls can monitor traffic coming in and going out of a network… …and produce log files for subsequent analysis Firewalls can enforce password controls to enter/use the network to try to prevent unauthorised users from gaining access Firewalls can enforce access policies so that only authorised users can access the network/parts of the network Firewalls reduce the risk of key logging software sending details to third parties by blocking the access out of the network *Disadvantages:* Firewalls are the central point of attack by hackers/potential intruders and once breached there are no further defences Firewalls can block legitimate process/applications so manual adjustment of settings may be required …can lead to allowing unwanted access by other processes if not configured by experts Firewalls are usually incapable of protecting against backdoor Trojans that open ports to send data to third parties who can then access the system Firewalls do not usually contain malware removal tools. *Max 6 for all advantages or all disadvantages.* *1 mark is available for a reasoned conclusion/opinion.*	**8**
2(b)	***Four*** *from:* Acts as intermediary for client requests for services such as a web page/a file Provide content filtering to control the content that is accessed/enforce acceptable use policies Provide user authentication to control web access Provide detailed logs of user web activity/flag up unacceptable use by employees Provide links to anti-malware applications to check incoming/outgoing data Filtering based on URL lists …DNS blacklists …based on lists maintained by third party companies Can provide NAT/anonymity of IP address.	**4**

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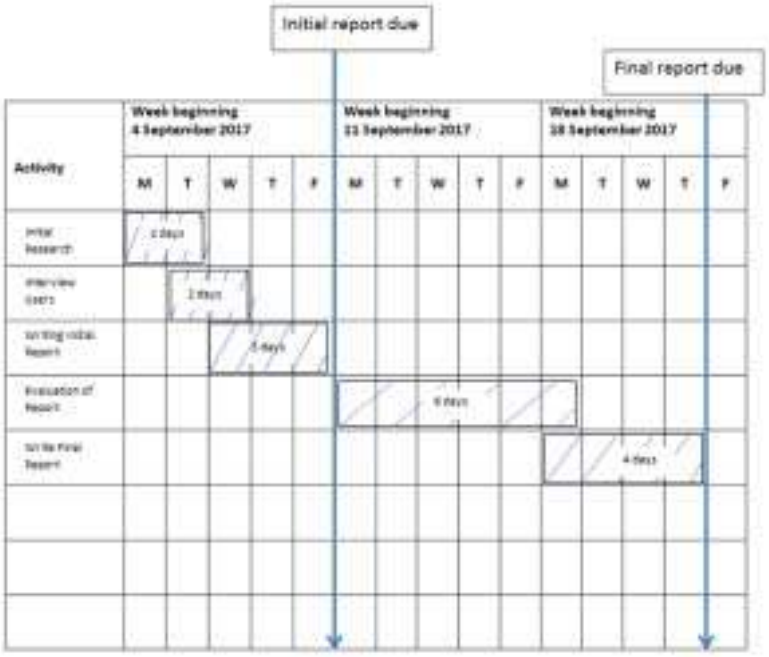
Question	Answer	Marks
3	***Eight** from:* All 5 correct labels/abbreviations in activity column 1 mark All 5 tasks in most appropriate order in chart 1 mark All 5 correct lengths of activity 2 marks 4 correct lengths of activity 1 mark less than 4 correct 0 marks Initial research/interview users in parallel and write initial report starts after initial research 1 mark Sequential tasks shown 1 mark (evaluation must start after write initial report) Initial report end before/on due date/1st Friday 1 mark Final report end on before/due date/2nd Thursday 1 mark E.g.  	**8**

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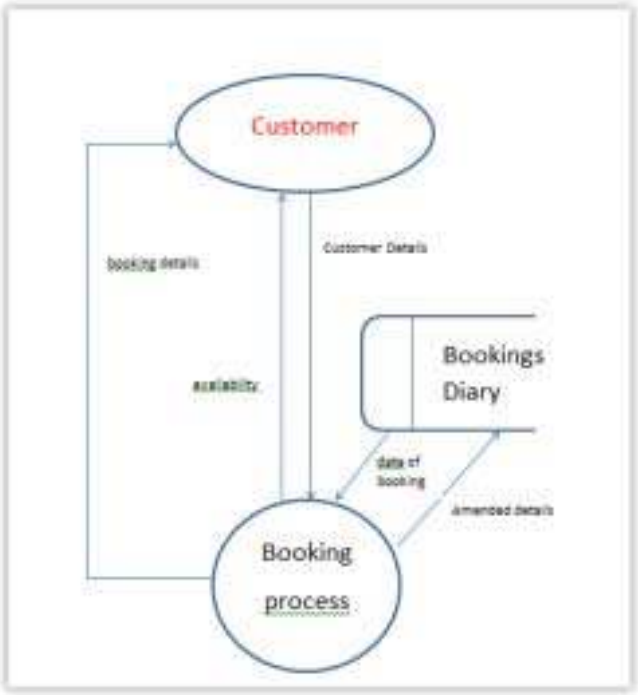
Question	Answer	Marks
4	***Eight*** *from:* e.g.  Customer with appropriate shape 1 mark Diary store with appropriate shape 1 mark Booking process with appropriate shape 1 mark 5 named arrows in correct direction 5 marks	**8**

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Question	Answer	Marks
5(a)	***Five** from:* Link the letter template to the data source Check/preview to check formatting/layout/spelling Insert merge field placeholders/codes for title, first name and family name and address line 1, address line 2, city and Zip code, country details in address space …except email address Insert merge field placeholders/codes for title and family name in area after 'Dear'.	**5**
5(b)	***Two** from:* Use filter/query on country field… …Country NOT New Zealand Select 'finish' merge to start the merge process to email Use 'skip if' on country field = New Zealand.	**2**
6(a)	***Four** from:* Information stored digitally as blocks of black/white squares Small dots throughout code converted to binary numbers when scanned …error correction algorithm used for validation Variety of encoding methods available which can be mixed Three larger squares store alignment data Smaller squares store angle/size data Scanned with narrow beam of light …reflection from white areas read by light sensor/camera May take up less space on packaging.	**4**
6(b)	***Two** from:* Information is instantly available to consumers Advertiser can decide the action the consumer takes when code is scanned QR codes are a proven (ISO) standard to be accessible to all Available information can be updated more easily Use of QR codes is measureable so can be analysed Reprinting of advertising material is reduced.	**2**
6(c)	***Four** from:* Code may contain URL link Web link followed URL contains a Trojan that infects the device Trojan is JavaScript …which contacts servers that transmit malware to device Use cross-site scripting vulnerability on a legitimate website to insert a malicious QR code in place of code …when a web browser opens the legitimate site, the QR code references the hacker's site Malicious QR codes can allow unauthorised people to control cell/mobile phones to access messages/GPS/turn on the camera(s)/listen in on phone conversations.	**4**

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Question	Answer	Marks
7	***Six*** *from:* Warping/deforming these from the original images so final image has same shape …use of forward mapping …each pixel in original image is mapped to an appropriate …pixel in final image …use of reverse mapping …each pixel in the final image is sampled for an usable/ appropriate pixel in the original …all final image pixels are mapped to an original image pixel Cross-dissolving the images …a sequence of images shows a gradual fade from one to the other …via a (series of) transition images …original image is gradually distorted and faded out …final image starts out totally warped to the first and is faded in.	**6**
8	***Eight*** *from:* *Advantages:* Increased quality of product …focusses on problems that are critical to end users …rather than technical problems of interest to developers More likely to complete project on time More likely to complete within budget …method focuses on incremental development so chances of failure are reduced More risk control …the key risk factors show in the early part of the process provides a flexible/adaptable process *Disadvantages:* Users are involved from the beginning and at all stages of the entire project… …takes more interaction throughout the entire life-cycle between users and developers …takes up the time of the experts …costs are likely to be higher RAD can be a new approach for some developers …new tools/methods will be more likely to fail the first time as the team learns the process Less control over the process as it is adaptable Poor design of prototypes …developers constantly make minor changes to individual components …ignore overall system architecture issues that produce a better overall design Not suitable for very large systems. *Max 6 for all advantages or all disadvantages.* *1 mark is available for a reasoned conclusion/opinion.*	**8**

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Question	Answer	Marks
9	***Six** from:* Code is embedded within the body HTML code (global) variable (tableout) is declared/created/initialised The HTML table values are placed within the variable First/outer loop (on 4th line of JS code) executes 10 times… …to create 10 rows using global variable and HTML <tr> code/to create each row Second/inner loop is executed each time outer loop executes …to create 10 columns/cells First time inner loop executes, the cell contains 1*1=1... …second time inner loop executes, the cell contains 1*2=2 …third time inner loop executes, the cell contains 1*3=3 …up to cell that contains 1*10=10 When inner loop reaches 10, first row of cells is complete… …next row is started with 2*1=2, 2*4 etc. …up to 2*10=20 The process continues until outer loop reaches 10 and all 10 rows have been created and filled.	**8**
10	**This question to be marked as Level of Response.** *Evaluation requires that advantages and disadvantages be discussed and weighed up in importance.* **Level 3 (7–8 marks)** Candidates will evaluate, in detail, by discussing the advantages and disadvantages of the use of satellites for data communications. The information will be relevant, clear, organised and presented in a structured and coherent format. There may be reasoned conclusions/opinions. Subject specific terminology will be used accurately and appropriately. **Level 2 (4–6 marks)** Candidates will evaluate by discussing the advantages and disadvantages of the use of satellites for data communications. For the most part, the information will be relevant and presented in a structured and coherent format. There may be reasoned conclusions/opinions. Subject specific terminology will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates will describe by giving the advantage(s) and/or disadvantage(s) the use of satellites for data communications. Answers may be in the form of a list. There will be little or no use of specialist terms. **Zero marks:** Response with no valid content.	**8**

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Question	Answer	Marks
	Answers may make reference to e.g.: *Advantages:* satellite communications: easier to setup of mobile communications are more economical than terrestrial communication over long distances is most economical especially for low network traffic demands in remote areas quality of transmitted signal is independent of distance quality of transmitted signal does not depend on location of sending and receiving stations country/owner has control over their own network *Disadvantages:* huge initial cost of manufacture/launch repair of satellite is almost impossible once it has been launched can be affected by severe weather conditions/very dark clouds can be affected by electromagnetic disturbances/events in space/sun activity annoying time gap/delay between exchange of data reducing the efficiency of satellite communications for data transmission.	
11	***Six*** *from:* Can be organised anywhere/time as long as there is connectivity Can use global resources Can be any language to reflect first language of students Can use any online tools that are available to students/known to students/available in the region Can use peer review/no exam pressures Time zones and physical boundaries can be ignored Can be organised quickly/as soon as you inform the students Learning is/can be in informal surroundings so student more relaxed Can reduce the costs to the college There are no other students to distract the learner Cross-discipline learning is easier/possible Learning can continue beyond the formal time scale of the course Encourages active learning beyond the course requirements Reduces costs to colleges.	**6**
	Total:	**90**

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