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Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

INFORMATION TECHNOLOGY **9626/12**

Paper 1 Theory **March 2019**

MARK SCHEME

Maximum Mark: 90

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1		4

You can use word processing software to create tables of data	✓
You can only use database software to create reports	
Spreadsheet software is used to produce charts	✓
You must always use web authoring software when creating web pages	
Financial modelling can involve the use of spreadsheet software	✓
Video editing software cannot be used to edit a music soundtrack	
Word processing software can include multimedia features	
You can only create data forms using database software	
Photo editing software is only used to edit photos	
A management information system (MIS) is a form of database management system	✓

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Question	Answer	Marks
2	The digital divide can exist between the educated and uneducated ✓ The digital divide can exist between those living in rural areas and those living in urban areas ✓ The digital divide does not exist between people from different economic classes Everyone these days owns a smartphone so the divide is closing rapidly Minority groups have no difficulty performing transactions on smartphones thereby reducing the divide Disabilities of potential internet users constitute another type of digital divide ✓ Some less developed countries have limited access to digital services ✓ Most tribal communities have universal mobile phone coverage in their community The digital divide only refers to those who can and cannot access the internet The price of connection to the internet tends not to vary between countries	4

Question	Answer	Marks
3	**Six** *from:* Max **five** *from:* Static information sources/magazines are more carefully checked for accuracy Once the data are created they cannot be changed easily There is a limited amount of information in a static information source/magazine/greater amount of information on the World Wide Web As soon as static data source/magazine is created it is very difficult to have information added to it A dynamic data source/website can have information updated quite quickly The data in a dynamic data source/website is usually up to date**/** static data tends to go out of date quickly There can be many contributors to a dynamic data source/website so the information can be inaccurate Must have **at least one** from: Both sources require the use of sophisticated analysis techniques Both sources will provide a mixture of relevant and irrelevant information.	6

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Question	Answer	Marks
4(a)	**Four** *from:* It operates/controls a device attached to the computer Without the required device driver, the corresponding hardware device fails to work It is an interface between operating systems/applications software and the device Tells the operating system how to communicate with the hardware device Upon installation it detects and identifies the peripheral device Wakes up the device when it is needed and puts it back to sleep when it is not Handles the translation of requests between a device and the computer Defines where outgoing data must be stored before it can be sent At least **two** examples of device drivers.	**4**
4(b)	**Four** *from:* Directly executes instructions of a high-level language program Translates a high-level language program into an intermediate stage Translates each line of source code and then executes that line/statement Reports on errors as lines of source code are entered An interpreter has to be resident in memory in order for the program to run.	**4**

Question	Answer	Marks
5	**Four** *from:* Proof reading is the careful reading and rereading of a yet to be finally-printed document To detect any errors and mark corrections It is a relatively slow and methodical search for errors Errors such as spelling mistakes, typographical mistakes and grammatical errors (must have at least two) Also checks for omitted words or word endings It may also involve checking of different elements of a layout Checking headings, illustrations and colours Good description of how proof reading is carried out.	**4**

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Question	Answer	Marks
6	**Six** *from:* *Similarities:* Both are types of mobile network Both allow smart phones to access the WWW Both allow video calling on phones Both allow emails to be sent by phone Both allow videos and music to be downloaded to a phone Both allow phones to be used as a SATNAV *Differences:* 4G has faster download speeds than 3G 4G enables smoother browsing with web pages failing to load, very rare unlike 3G 4G allows videos and music to be streamed without the buffering and freezing found on 3G networks Batteries last longer on 3G than on 4G 3G data allowance tends to be cheaper than 4G **Must have at least one of each to gain full marks.**	**6**

Question	Answer	Marks
7(a)	**Two** *from:* Transaction file is validated Transaction file must be sorted… …in same order as master file/sorted on Customer_ref_no	**2**

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Question	Answer	Marks
7(b)	**Six** *from:* First record in the transaction file read… …belonging to 256431 Reads first record in the old master file… …belonging to 256431 These two records are compared If records do not match computer writes master file record to new master file… …next record is read from master file and these two records are compared and process is repeated Records match so transaction is carried out Computer calculates the New_balance, Old_balance + Goods_bought – Payment… …0 + 3800 – 3800 (0) Using Old_balance, 0 from master file Using Goods_bought 3800, Payment made, 3800 from transaction file Processed record is written to new master file Next record is read from transaction file… …belonging to 319852 then compared to next master file record… ... belonging to 319852 This continues until the last record from the transaction file record is read … …belonging to 943201 After processing the last record of the transaction file… …belonging to 943201… …all the remaining old master file records are written to the new master file… …in this case, one record 963584.	**6**
7(c)	**Five** *from e.g.:* Use a range check on the Payment field between 2000 and 20000 As customers must make a payment of at least 2000₹ and customers have a credit limit of 20000₹ Have a limit check on the Goods_bought field as they cannot be more than 20000₹… …customers have a credit limit of 20000₹ It is impossible to spend less than 0₹… …so a lower limit to the range is unnecessary A limit check has only one limit but a range check has two – an upper and lower limit There are alternative answers if fully reasoned.	**5**

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Question	Answer	Marks
8	**Six** *from:* Server/computer to handle video-conferencing software Laptops/PCs/tablets for each participant to enter data Microphones to input participants' voices/sound Large screen/monitor so that all the directors can be seen Speakers for participants to hear what the directors are saying Cameras to input pictures of participants Router to connect to internet/codec to connect to telephone network.	**6**

Question	Answer	Marks
9	**Six** *from:* Health issues arise from long term use of computers Safety issues can result in a sudden accident/can result in serious injury Health issues tend to be RSI/carpal tunnel syndrome, lower back pain, eye strain, headaches, upper back pain, neck pain, shoulder pain (must have at least two) *Health issues can be caused by:* Max **two** *from:* Typing at a keyboard **continuously** Gripping a mouse and **repetitive** clicking Sitting in the **same position/with wrong posture all day** Staring at a computer screen **continuously/all day** **Glare** from screen Safety issues tend to be fire hazards, electrocution, personal injury (must have at least two) *Safety issues can be caused by:* Max **two** *from:* Overloading sockets causing overheating Overheating of computers Water spilt on to live wires Handling bare wires, Trailing cables can cause users to trip up Heavy objects falling off tables.	**6**

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Question	Answer	Marks
10	**Eight** *from:* Inclusion of all eight fields mentioned in question Must be text boxes or individual character boxes Equipment_name and Manufacturer space bigger than Equipment_code and Hire_price and generally sensible spacing Drop down dates for Date_hired or clear view of calendar Radio buttons for Loyalty_customer (Y/N) Navigation buttons (at least 2) Help button/information on how to complete the form Appropriate title Appropriate white space and information fills the page.	**8**

Question	Answer	Marks
11(a)	Select G2:K4	**1**
	Click the Name box at the left end of the formula bar	**1**
	Type Roles and press enter	**1**
	Or	
	Select G2:K4	**1**
	On the Formulas tab, in the Defined Names group, click Define Name	**1**
	In the New Name dialog box type Roles and press enter	**1**
11(b)	=D7*HLOOKUP(B7,Roles,3,FALSE) D7* outside the brackets 1 mark HLOOKUP() 1 mark (B7 1 mark ,Roles 1 mark ,3 1 mark FALSE) 1 mark Items must be in correct position to gain a mark.	**6**

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Question	Answer	Marks
12	**Eight** *from:* Evaluation based on: *Advantages of HDDs/Disadvantages of SSDs:* Hard disks tend to have higher storage capacities than SSDs Hard disk drives still cost less per gigabyte than SSDs HDDs last longer than SSDs The NAND flash used in SSDs can only be used for a finite number of writes The choice and availability of SSDs is still limited compared to HDDs *Disadvantages of HDDs/Advantages of SSDs:* Hard disk drives are more susceptible to shock and damage… …as there are moving parts SSDs have faster data transfer rate SSDs have quicker boot ups SSDs can have almost instantaneous data access HDDs data access speeds is dependent on how close the data is to the read/write heads… All parts of the SSD can be accessed at once SSDs use significantly less power at peak load than hard drives… SSD's energy efficiency can deliver longer battery life in laptops than HDDs With no moving parts SSDs run at near silent operation unlike whirring hard disk drives SSDs weigh considerably less than hard drives SSDs make laptops more portable **Must have at least one from each to gain full marks.**	**8**

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Question	Answer	Marks
13	**Level 3 (7–8 marks)** Candidates will describe the advantages and disadvantages of both uses of encryption. The issues raised will be justified. The information will be relevant, clear, organised and presented in a structured and coherent format. Specialist terms will be used accurately and appropriately. **Level 2 (4–6 marks)** Candidates will describe the advantages and disadvantages of both uses of encryption although development of some of the points will be limited. For the most part the information will be relevant and presented in a structured and coherent format. Specialist terms will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates may only address one use of encryption, and give basic advantages/disadvantages. Answers may be simplistic with little or no relevance. There will be little or no use of specialist terms. **Level 0 (0 marks)** Response with no valid content. Candidates may refer to, e.g. Disk encryption: *Advantages* Files encrypted by one user cannot be opened by another user if they do not possess appropriate permissions After encryption a file remains encrypted regardless of where it is moved Encryption can be used on any files including executable files Users with permission to decrypt a file are able to work with the file without experiencing any restrictions/difficulties Other users receive a restricted access notification when they attempt to access the encrypted file *Disadvantages* If the password is lost or reset it becomes impossible to gain access to files on the drive If the operating system fails it becomes impossible to gain access to files If the operating system has to be reinstalled it becomes impossible to gain access to files... ...data can be lost irreversibly	**8**

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Question	Answer	Marks
13	Email encryption: *Advantages* As modern technology becomes more sophisticated, so do hackers so sophisticated encryption is essential Passwords on email accounts are not enough Email providers tend not to automatically encrypt email messages nor attachments Without encryption a person/malware could potentially read someone's emails The recipient's email provider server may not be secured Without encryption, messages can be stored as plain text, making it easy for anyone to read and understand When encrypting emails, the text stored in the message and files are scrambled up both in storage and transit... ...the only way to unscramble and read the content is to use a decryption key *Disadvantages* Hackers can still intercept and delete emails Encrypting emails to a new recipient using a private key requires the key to be sent which can be intercepted by a hacker Managing digital certificates can become complex and time consuming.	

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