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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 **October/November 2018**

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

Verifying data is checking that data is correct.	
Validating data is checking that data is correct.	
Validation is the process of checking that the data entered into a system is the same as the source data.	
Visual verification is a type of verification.	✓
A range check is an example of verification.	
Validation is checking that data is sensible.	✓
A range check is the best check to make sure transposition has not occurred when typing in a bar code.	
Visual validation is a type of validation.	
Double data entry is a type of verification.	✓
A type check will prevent a letter of the alphabet being typed into a numeric field.	✓

Question	Answer	Marks
2		4

A scanner can be both an input and output device.	
A touch screen can be both an input and output device.	✓
Input devices allow the user to communicate with the computer's operating system.	✓
Output devices allow data to be stored electronically for future use.	
Inputs must be converted to analogue data before they can be processed by the computer.	
All inputs come in the form of digital data.	
A plotter is an output device	✓
Outputs always come in the form of a printout.	
A microphone is an input device.	✓
A pen drive is an input device.	

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Question	Answer	Marks
3	Trojan Horse: **Two** *from:* A malicious computer program which is used to hack into a computer by misleading users of its true intent/disguises itself as authentic software (unlike computer viruses and worms) Trojans generally do not attempt to infect other files They do not attempt to self-replicate themselves Worm: **Two** *from:* A standalone malicious computer program that replicates itself in a computer system Many copies are then sent to other computers Worms almost always cause some harm/slowing down to the network … … even if only by consuming bandwidth Spyware: **Two** *from:* Software designed to collect information about a computer user's activities Data such as passwords is passed to a remote server/attacker/hacker (without the user's knowledge) A keylogger is a type of spyware (which collects a record of the user's key strokes) Adware: **Two** *from:* Automatically generates advertisements in order to gain revenue for its author Advertisements may appear in the user interface/screen shown to the user by the software Examines which internet sites visited and presents advertising according to the types of goods/services featured on these/usually the type of goods/adverts the user is interested in.	**8**

Question	Answer	Marks
4(a)	**Three** *from:* Do not have to spend time learning HTML/do not have to be an expert/have much experience/many skills to make a fully functional website Most web authoring packages involve basically pointing and clicking to create a web page rather than typing in instructions It is more difficult to remember the various HTML codes for creating web pages Writing HTML would take much longer/it saves time when it comes to creating content/establishing the layout/graphical elements of the page.	**3**

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Question	Answer	Marks
4(b)	**Three** *from:* It limits the user's options as a designer Such programs rely on templates with limited options for the look and feel of the site Depending on the type of software, user may not be able to implement video or other common web-design elements Software may make user completely reliant on it … ... if the program suddenly becomes unavailable for some reason user cannot create a website Knowledge of HTML means web pages can be designed regardless of what software is available/only needs a simple text editor.	**3**

Question	Answer	Marks
5	**Four** *from:* Both provide representations of mathematical operations/equations Both can involve the use of cell references within them Both are not visible in csv format A function is also a formula, but the parts have been predefined by the spreadsheet software Formulae can be as simple or as complex as the user wants Instead of having to accurately type out the details of the formula a function acts as a shortcut to carry them out A formula can contain a function, but it is possible to write a formula without a function A function is provided by the spreadsheet software Most functions have criteria, but not always as with RAND() A formula is something that is user-created and can include spreadsheet functions For example, =C3-D2 is a formula For example, AVERAGE() is a function Must have at least one similarity and one example to gain full marks.	**4**

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Question	Answer	Marks
6	**Four** *from:* Developers can be freer to test all of the aspects of the machine without worrying about damaging an expensive machine Can provide results that are generally not measurable in some experiments (e.g. all weather conditions) Computer simulation can allow you to see how a system might respond before you design or modify it, thus avoiding mistakes It is cheaper as there is no need to make different prototypes to test them out It is safer to use a model and simulation for nuclear power plants/learning to drive/fly Designing an item as a model on a computer before the real item is built saves time Models allow accurate prediction of changes in trends or patterns Critical situations can be investigated without risk Critical situations can be created more quickly Can be slowed down to study behaviour more closely.	**4**

Question	Answer	Marks
7(a)	**Two** *from:* Asymmetric/asynchronous digital subscriber line Bandwidth and bit rate is greater toward the subscriber/downstream than the reverse/upstream hence asymmetric/asynchronous ISPs usually provide ADSL as a service for consumers to receive Internet access in a relatively passive mode The maximum reliable speed which could be achieved is usually lower than that which modern video-conferencing systems require. **1 mark**	**3**
7(b)	**Two** *from:* Symmetric/synchronous digital subscriber line Bandwidth and bit rate in the downstream direction/from the network to the subscriber is identical to the bandwidth in the upstream direction/from the subscriber to the network SDSL is generally aimed at business customers/ADSL is marketed at private as well as business customers SDSL is more expensive than ADSL but a better choice for high-quality video-conferencing as allows much higher bandwidth. **1 mark**	**3**

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Question	Answer	Marks
7(c)	**Two** *from:* Integrated Services Digital Network Allows simultaneous digital transmission of voice, video, data, other network services over public switched telephone network Circuit-switched telephone network system which also provides access to packet switched networks Results in potentially better voice quality than an analogue phone can provide **One** *from:* ISDN video-conferencing systems still in use as high-definition is achievable using a Primary Rate Interface (PRI) Is very cost prohibitive and can achieve the same results with SDSL for a lot less.	**3**

Question	Answer	Marks
8(a)	***Check digit check*** for transposed digits in A7 – **1 mark** 67 instead of 76 would have resulted in a different check digit being calculated – **1 mark** ***Type check*** to check for invalid characters in A10 – **1 mark** xy would register as text in a numeric field – **1 mark** ***Length check*** to check exact number of characters entered in A16 – **1 mark** Would have registered that only 10 characters entered – **1 mark** ***Format check*** to check that correct format has been followed in B10 – **1 mark** Would have trapped two letters and two digits entered instead of one letter followed by three digits – **1 mark**	**8**
8(b)	=VALUE(LEFT(A2,3)) VALUE() – **1 mark** LEFT(A2, 3) – **1 mark** **Two** *from:* Highlight D2 and select format (format cells)/right click and select format cells Select currency Set to $ and 2 decimal places.	**4**

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Question	Answer	Marks
9	**Five** *from:* Table name – a unique name for each table in a database Field name – to identify each field The data type allocated to each field – e.g. text, numeric, Boolean Field length – the number of characters in each field Field default value, where present, is the value automatically entered in that field when a new record is created Validation – the validation check applied to each field Table security – Keys – primary keys are identified Relationships – relationships between tables are stated – one to one, one to many.	**5**

Question	Answer	Marks
10(a)	Cars: Award one mark for two correct fields, two marks for three correct fields, three marks for four correct fields, four marks for five correct fields Agents: Award one mark for each correct field Showrooms: Award one mark for two correct fields, two marks for three correct fields.	**10**

Cars:

Field1	Field2	Field3	Field4	Field5
Car ID	Make	Model	Agent ID	Showroom ID

Agents:

Field1	Field2	Field3	Field4
Agent ID	Agent first name	Agent second name	Agent Email

Showrooms:

Field1	Field2	Field3
ShowroomID	Showroom	District

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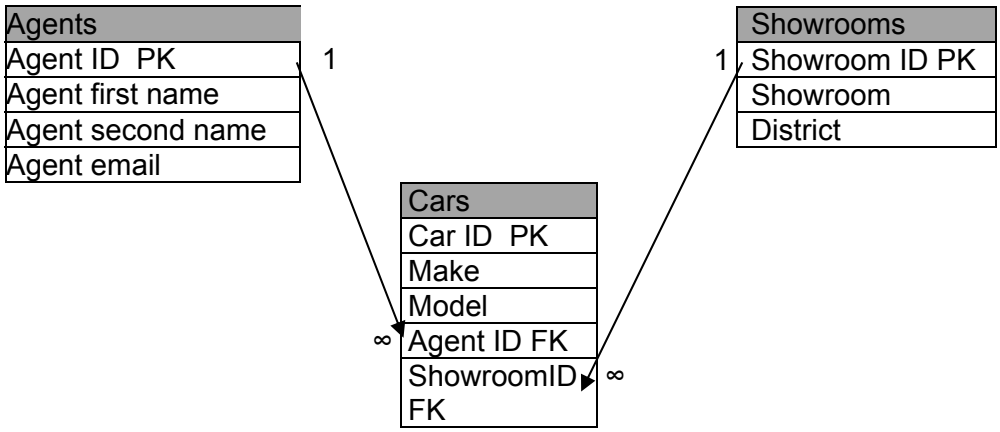
Question	Answer	Marks
10(b)	 **Maximum 8** *from:* 1 mark for each correct relationship (2) 1 mark each for identifying one to many (2) 1 mark for each correct primary key (3) 1 mark for each correct foreign key (2)	**8**

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Question	Answer	Marks
11	**Level 3** **(7–8 marks)** Candidates will discuss the importance of RAM, ROM and hard disks including the advantages and disadvantages. Candidates will explain the effectiveness of these items in detail. The information will be relevant, clear, organised and presented in a structured and coherent format. There may be a reasoned conclusion/opinion. Specialist terms will be used correctly and appropriately. **Level 2** **(4–6 marks)** Candidates will discuss the advantages and disadvantages of RAM, ROM and hard disks. For the most part, the information will be relevant and presented in a structured and coherent format. There may be a conclusion/opinion. Specialist terms will be used appropriately and for the most part correctly. **Level 1** **(1–3 marks)** Candidates will present an advantage or disadvantage of two of RAM, ROM and hard disks. Candidates will describe at least one of these items. There will be little or no use of specialist terms. **Level 0** **(0 marks)** Response with no valid content. Candidates may refer to for e.g. RAM / ROM allows quicker access to data than HDD HDD or the Hard Disk Drive stores information for permanent storage/long term whereas RAM only stores information for relatively short-term usage Data in RAM is deleted once the power to the device is stopped RAM stores active program data whereas ROM is unable to RAM stores data that the user is currently working on whereas ROM is unable to Large RAM chips can be read faster than most ROMs ... ... ROM content is sometimes copied to RAM and subsequently read from RAM Hard disks can be portable and easy to move from device to device unlike ROM/RAM Data in RAM can be accessed much faster than the data on a hard disk Hard disk drives are electromechanical devices and more prone to failure than RAM/ROM – no moving parts In a normal computer configuration RAM size is much smaller than the hard disk size ROM cannot be changed by a program or user ROM/HDD retains its data even after the computer is turned off ROM stores the instructions for the computer to start up when it is turned on again Would be expensive to save an operating system on ROM so need hard disk Still need to have boot up instructions to activate hard disk drive so ROM is needed.	**8**

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Question	Answer	Marks
12	**Eight** *from:* Advantages: Cost of buying a server is saved … … does not need a server because individual workstations are used to access the files No need to pay for System Administrator/network technicians because each user sets their own permissions as to which files they are willing to share Much easier to set up than a client-server network as it does not need specialist knowledge The over-all cost of building and maintaining this type of network is comparatively cheaper If one computer fails it will not disrupt any other part of the network except the files on that computer are not available to other users at that time/in client-server network, if server goes down whole network gets affected Disadvantages: Files and folders are difficult to recover as they cannot be centrally backed up/each computer has to have its own back-up system Files and resources are more difficult to share There is less security other than permissions/users often do not need to log onto their workstations. The system is not centralised so it is difficult to administer/one person cannot determine the accessibility setting of whole network Each computer is fulfilling more than one role, it may be printing or file sharing so performance can be slower Security is more expensive as each computer must have its own anti-virus scanner Difficult to have more than a few users If sharing a large database which increases in size computers would need to increase their storage capacity/client-server which only needs to upgrade server Because each computer might be being accessed by others it can slow down the performance for the user unlike client-server Ensuring that viruses are not introduced to the network it is the responsibility of each individual user/client-server has central virus protection distributed to each computer.	**8**

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