Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

INFORMATION TECHNOLOGY **9626/13**

Paper 1 Theory **May/June 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.

Cambridge International is publishing the mark schemes for the May/June 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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.

Question	Answer		Marks
1	Operating systems are examples of hardware.		4
	An Optical Mark Reader and a Magnetic Ink Character Reader are types of storage device.		
	A scanner is a type of software.		
	Hardware is another name for the physical parts of a computer system.	✓	
	A bar code reader is an example of an input device.	✓	
	The CPU of a computer is considered to be hardware.	✓	
	A device driver is a type of hardware.		
	System and application are the names of two types of software.	✓	
	A dot matrix printer is an example of software.		
	Applets and apps are examples of hardware.		

Question	Answer		Marks
2	You should use different passwords and PINs for different accounts.	✓	4
	Storing personal data on removable media only and locking them away when not in use, is a good form of protection.	✓	
	Encryption prevents data from being accessed.		
	A firewall always prevents unauthorised users from accessing confidential data.		
	Installing spyware helps protect confidential data from unauthorised access.		
	Banks are allowed to share personal data of customers with other customers.		
	Confidential personal data is usually stored on DVD ROMs as this prevents it from being accessed.		
	TLS is a cryptographic protocol used to protect personal data transmitted across a network.	✓	
	Users should always log off immediately after using a site where personal data has been typed in.	✓	
	Using public computers to access personal information is good practice as they usually have plenty of security.		

Question	Answer	Marks
3	**Five** *from*: Both involve comparing data that has been/is being entered with another copy Both involve checking that data has been entered correctly not that it is correct Visual verification is visually checking the entered data against the source document Double data entry is usually two people entering the data/entered (by the same person) twice (and each version compared against the other) Visual verification is carried out by a human/user/yourself Double data entry – verification is carried out by the computer Visual verification will enable the user to see mistakes if they have been made With double data entry the computer will alert user to the fact that a mistake has been made and they decide which version has been copied correctly.	**5**

Question	Answer	Marks
4	**Six** *from*: A direct data source is a source where data is collected for a specific purpose or task Examples of direct data sources are questionnaires or data logging An indirect data source is when data is obtained from a third party not necessarily related to the current task *Direct data source* It gives us data that is often called 'original source data' Questionnaires could be distributed amongst farmers and local people asking about the effects of pollution Interviews could be carried out with farmers and local people asking about the effects of pollution Data logging – sensors could be used to gather pollution data that could be processed and interpreted *Indirect data source* Means data that was collected for a particular reason but is then used for another purpose Could collect data from local government agencies which may have pollution data for the local area Could collect data from local environment groups.	**6**

Question	Answer	Marks
5	**Six** *from*: Compiler and interpreter both convert high level programming language to a lower level Both are examples of system software A compiler converts the high-level instructions into machine language An interpreter converts the high-level instruction into some intermediate form and after that the instruction is executed The entire program is compiled before being executed The interpreter translates one statement at a time, executing the statement before moving on to the next one A list of errors is created by the compiler after the compilation process An interpreter stops translating after the first error When executed, the compiled program is executed directly using the machine code An interpreter has to be resident in memory in order for the program to run Interpreted programs can be modified at runtime by adding/changing functions A compiled program has to be recompiled fully even for small modifications to be made.	**6**

Question	Answer	Marks
6(a)	**Three** *from*: Students whose families can afford the devices have an unfair advantage Teachers find it difficult to manage learning activities when they have to support multiple platforms and device types Some activities and applications may only be compatible with certain devices The gap widens as underprivileged students lack access to high performance computers at home Underprivileged students do not have internet access at home so they do not learn the same things putting them at a distinct disadvantage.	**3**
6(b)	**Three** *from*: Teachers could be given time to train on and understand the platforms they are using Teachers could have to learn how to integrate them into a class of students who may not have access to the internet or mobile devices at home Schools need to have different versions of software that can be used on all devices Libraries and schools should offer technology training for parents A fund for the purchase or subsidy to purchase machines for poor children A stock of spare machines kept in school in case students do not have machines A list of software could be issued to staff which runs across all platforms.	**3**

Question	Answer	Marks
7(a)	**Two** *from*: A cell is a specific location within a spreadsheet and is defined by the intersection of a row and column Cells are often referenced by a letter and number combination For example, C6 is the cell containing the value 7. Must have an example to gain both marks.	**2**
7(b)	**Two** *from*: Rows run horizontally in a worksheet Each row is identified by a number in the row header Row 7 is highlighted in the spreadsheet/contains the values 4, 6, 9, 15, 5. Must have an example to gain both marks.	**2**
7(c)	**Two** *from*: Columns run vertically in a spreadsheet Each column is identified by a letter in the column header Column C is highlighted in the spreadsheet/contains the values 11, 7, 9, 6, 8. Must have an example to gain both marks.	**2**
7(d)	**Two** *from*: A worksheet or sheet is a single page in a spreadsheet Each worksheet has a name and by default the worksheets are named Sheet1, Sheet2 and Sheet3 In this example they are named Values, Formulae and Functions. Must have an example to gain both marks.	**2**

Question	Answer	Marks
8(a)	**Telephone**:	
8(a)(i)	Validation rule 1	
	Length check	**1**
	to check that phone number is exactly 12 characters.	**1**
8(a)(ii)	Test Data e.g. 01632 27564, 01632 2756422	**1**
	Reason these are examples of data less than 12 characters and more than 12 characters.	**1**

Question	Answer	Marks
8(a)(iii)	Validation rule 2	
	Format check	**1**
	to check that each phone number has 5 characters, a space followed by 6 characters.	**1**
8(a)(iv)	Test Data e.g. 0163 256667, 016322 27655, 01632348976, 01632 454631	**1**
	Reason any valid reason matching data chosen.	**1**
8(b)	**Weekly wage:**	
8(b)(i)	Validation rule	
	Range check	**1**
	to check is not lower than 180 and not more than 310	**1**
8(b)(ii)	Test Data any example of extreme and abnormal data	**1**
	Reason abnormal is outside the range and should trigger an error message. Extreme is on the edge of the range but should be accepted.	**1**
8(c)	Text	
	There is a space in between the digits	**1**
	There is a leading zero	**1**
	No calculations would be needed on the field.	**1**
8(d)	=AVERAGEIFS(D2:D14,E2:E14,">40",E2:E14,"<50") =AVERAGEIFS() – 1 mark (D2:D14, – 1 mark First E2:E14, – 1 mark “>40”, immediately after E2:E14 – 1 mark Second E2:E14, – 1 mark “<50” immediately after E2:E14 – 1 mark	**6**
8(e)	**Three** *from*: Select A2:E14 Sort in ascending order of column D Add a level Sort in ascending order of column E/column B/column A. Must be in this order.	**3**

Question	Answer	Marks
8(f)	=CONCATENATE(LEFT(B13,1)," ",A13) =CONCATENATE() – 1 mark LEFT(B13,1), – 1 mark ," ",A13 – 1 mark	**3**

Question	Answer	Marks
9	**Eight** *from*: Allows records to be accessed either sequentially in the order they were entered or randomly using an index Each index defines a different ordering of the records A database may have several indexes, based on the information required A key is specified in each index It is a method of indexing data for fast retrieval Data is organised into records which consist of fixed length fields A set of hash tables known as indexes contain "pointers" into the records Individual records can be retrieved without having to search the entire file Indexes can be searched quickly, thereby allowing the database to access only the records it needs Searches use an index which will narrow down the records/data to be searched Then that section of the file is searched sequentially to find the record required.	**8**

Question	Answer	Marks
10	**Eight** *from*: MICR characters are readable even if a document is obscured by marks or overprinted MICR systems provide a high level of security since MICR documents are difficult to forge The error rate for reading MICR characters is small as compared to other character recognition systems Printing of MICR is demanding, requiring difficult-to-achieve standards which causes it to be slower to print MICR readers are expensive to purchase Capable of recognising only MICR fonts written in a specific format MICR printers run on cartridges that cost far more than other toner cartridges OCR is much faster than someone manually entering large amounts of text OCR is cheaper than paying someone to manually enter large amounts of text OCR can allow documents to be made editable MICR does not OCR – all documents need to be checked over carefully and then manually corrected OCR – not 100% accurate, there are likely to be some mistakes made during reading... ...such as 1 and I, O and 0.	**8**

Question	Answer	Marks
11	To be marked as a level of response: **Level 3 (7–8 marks)** Candidates will describe the advantages and disadvantages of mobile networking compared to other types of network. 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 mobile networking compared to at least one other type of network 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 side of the argument, 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.: *Advantages* Mobile networks generally offer much more coverage than other systems such as WiFi... ...which forces users to depend upon hotspots in each area visited 4G offers a coverage of 30 miles and more and with overlapping network ranges so users are usually assured of complete connectivity at all times Big problem with WiFi networks is online security so mobiles more secure Mobile devices can be used out in the field Portability is one of the main advantages of mobile computing, you are not restricted to one location in order for you to get jobs done *Disadvantages* Mobile networks are more expensive than traditional WiFi networks to use Quality of connectivity can be poor if you are not near any of the normal connections (Wifi, 3G, 4G) Mobile VPNs are unsafe to connect to, and also syncing devices might also lead to security concerns Power consumption- due to the use of batteries in these devices, these do not tend to last long.	**8**