Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

INFORMATION TECHNOLOGY **9626/12**

Paper 1 Theory **May/June 2017**

MARK SCHEME

Maximum Mark: 90

Published

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This document consists of **9** printed pages.

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Question	Answer	Marks
1		4

A WAN is a Wireless Area Network.	
A LAN is a Live Area Network.	
A LAN covers a smaller geographical area than a WAN.	✓
A WAN has a higher data transfer rate than a LAN.	
Unlike a LAN, the signal does not deteriorate in a WAN.	
A LAN does not need a router to connect computers together.	✓
A WAN experiences more data transmission errors than a LAN.	✓
A WAN has a lower bandwidth than a LAN.	✓
The internet is an example of a LAN.	
A WAN is more secure than a LAN.	

Question	Answer	Marks
2		4

A knowledge base is a key component of an expert system.	✓
Experts do not need to make a judgement. They just accept the results of the expert system.	
The user interface is used for both input and output.	✓
The rules base can contain IF…THEN statements.	✓
The inference engine searches the user interface to find possible solutions.	
An expert system is often used in car driving simulators.	
An expert system is not as accurate as a single expert would be.	
A knowledge engineer is employed to create an expert system.	✓
An expert system never needs updating.	
Expert systems always come up with exact solutions.	

Question	Answer	Marks
3	***Three*** *from:* 1 mark each Data that does not change It can be read without being written back to a file/not changed when written back Limited amount of information in a static information source… …because as soon as it is created it is difficult to have information added to it Static data tends to go out of date quickly. Appropriate example such as a CD ROM contains static data. 1 mark	**4**

Question	Answer	Marks
4	***Four*** *from:* Read the text carefully to find/correct typographical errors/mistakes in grammar/style/spelling Printing a copy is sometimes better than reading on screen Read the essay out loud… …he will hear other problems that he may not see when reading silently He could use a blank sheet of paper to cover up the lines below the one he is reading… …which keeps him from skipping ahead of possible mistakes Use the search function of the computer to find mistakes he is likely to make Search for "it," for instance, if he confuses "its" and "it's", "there" for "their" or "they're" Check separately for each kind of error he is likely to make, moving from the most to the least important Read through once backwards, sentence by sentence Read through again forward to be sure subjects and verbs agree.	**4**

Question	Answer	Marks
5	To be marked as a level of response: **Level 3** **(7–8 marks)** Candidates will describe each check and give benefits and drawbacks of each check/consider different reasons for using each check. 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 each check and give benefits and drawbacks of checks/consider different reasons for using each check although development of some of the points will be limited to benefits or drawbacks. 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 describe checks, and give basic reasons. 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. Answers may include: A range check could only be carried out on the student number if you knew the lowest and highest number. Invalid numbers/non-existent numbers might be entered which are within the range so would be accepted. A range check on each part of the date of birth could be carried out. Would prevent negative days/days greater than 31 being entered. Would prevent months less than 1 or greater than 12 being entered. Would prevent years less than 2000 or greater than 2001 from being entered. Would not prevent dates like 30/02/2000 or 31/06/2000 being entered. Check digit can only be carried out on long strings of numbers – Student number is not really long enough. Check digit would pick up transposed numbers which none of the other checks would. Date of birth is not in correct format for a check digit to be used. Format check could be used on date of birth nn/nn/nnnn. Format check would not pick up nonsensical dates of birth such as 68/99/3000. Format check would pick up data entry errors such as a three digit day/month/single digit day/month/two digit year.	**8**

Question	Answer	Marks
6(a)	***Three*** *from:* Translates the whole program as one complete unit Creates an executable file Is able to report on a number of errors in the code after compilation Does not need to be present in order to run the code Can optimise source code to run as fast or as efficiently as possible.	**3**
6(b)	***Three*** *from:* Translates each line of source code into an intermediate stage and then executes that line/statement Reports on errors as lines of source code are entered Only a few lines of source code needs to be in memory at any one time Some interpreters execute code within a 'virtual machine'… …these have been designed to disallow code from directly accessing the computer.	**3**

Question	Answer	Marks
7	***Six*** *from:* Sensors are used to feed data back to a computer Naming of physical variables and the sensors/devices used to gather data Analogue data is converted into digital for the computer to process using an analogue to digital converter Computer stores readings in a table ready for processing Computer plots graphs automatically Computer calculates minimum and maximum temperature/rainfall/wind speed/atmospheric pressure for the day/month/year so far Computer outputs the <u>results/graphs</u> on screen/printer.	**6**

Question	Answer	Marks
8(a)	***Three*** *from:* Involves using cell phone text/SMS messages to persuade people to divulge their personal information The text message may include a website URL, inviting the receiver to go to the site… …looks just like the actual bank's website but is a fake website The text message may include a telephone number that connects to an automated voice response system/person asking for bank details The smishing message usually contains something that demands the target's immediate attention The website then asks them to enter their personal/financial information.	**3**

Question	Answer	Marks
8(b)	***Three*** *from:* Installs a piece of malicious software/code on customer's computer Creates a fake website which looks like the actual bank's website Fraudster redirects genuine website's traffic to own website… …customer is now sending personal details to fraudster's website unknowingly.	**3**

Question	Answer	Marks
9	***Six*** *from:* The divide between people who have access to and the resources to use new information/communication technology and those who do not This technology can include the telephone, television, personal computers and the internet The divide between those who have the skills, knowledge and abilities to use the technologies and those who do not The digital divide can exist between those living in rural areas and those living in urban areas… …due to lack/expense of infrastructure in rural areas The digital divide can exist between the educated and uneducated The digital divide can exist between economic classes The digital divide can exist between old and young people… …as young people have grown up with the technology/older people may feel they are too old/unwilling to learn about new technology/do not know how to use it May refer to inequalities between individuals, households, businesses, or geographic areas The divide between countries or regions of the world is referred to as the global digital divide The quality of connection to the internet may vary between groups/countries The price of connection to the internet may vary between groups/countries *Can be overcome by:* Community teaching programmes to teach older people how to use advanced technology Giving cheap computers/laptops to school children from poor backgrounds Setting up cyber cafes in rural areas Providing overseas aid to poor countries to purchase the technology.	**6**

Question	Answer	Marks
10(i)	**C** Date_of_birth and: Date as it is in the form dd/mm/yyyy 1 mark 3 bytes as it would be stored as an integer 1 mark	**2**
10(ii)	**D** Gender and: Boolean, there are only two entries 1 mark 1 byte as it could be set to True/False, –1/0 1 mark	**2**

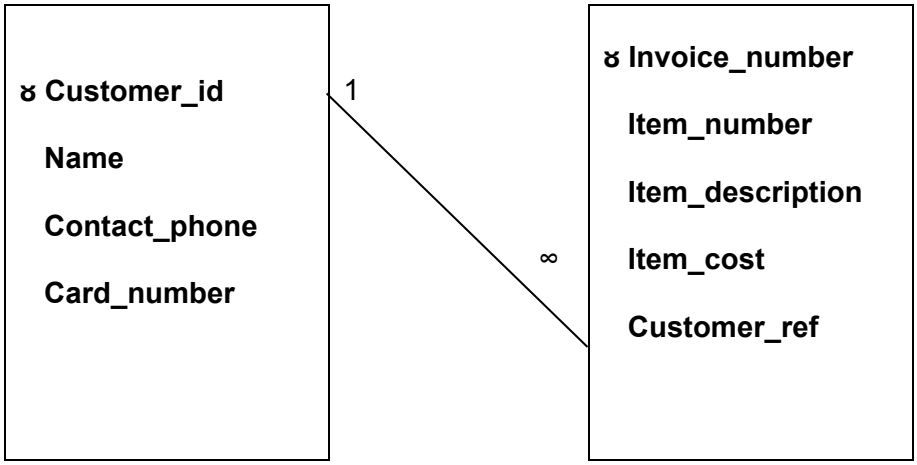
Question	Answer	Marks
10(iii)	**E** Marriage_state and: Text as it consists of letters/Lookup table as there are only three options 1 mark 8 bytes Divorced is the longest entry, 8 characters long 1 mark	**2**
10(iv)	**F** Number_of_children and: Numeric, integer as can only have <u>whole</u> number of children 1 mark 3 bytes as it is stored as an integer 1 mark	**2**

Question	Answer	Marks
11	***Six*** *from:* Send emails to every person being invited informing them of the conference Rajvinder sends log in details to the directors/users Uploads any necessary documents for the meeting Sends a link to the website Enter his user name and password (obtained from the provider) Select a start time and end time In the meeting area, type an agenda Using the software select participants Select appropriate meeting space/room Select those participants who can enter the room Choose those who can be presenters/those that can modify documents Limit the participation of participants/mute volume/disable messaging/disable cameras.	**6**

Question	Answer	Marks
12	Discussion based on: *Benefits* Testing nuclear reactor designs using computer models avoids safety problems… …such as explosions/meltdowns Testing nuclear reactor designs using computer models cuts costs… …as do not have to pay as much money for workers/materials to replace damaged reactors Can obtain results in a short period of time regarding reactions that take a long time in real life Re-designing computer models is cheaper than re-building a nuclear reactor Researchers will have the tools to simulate scenarios that are hard to observe in operating reactors *Drawbacks* Researchers will need to know how to apply simple modelling techniques in some situations and more complicated ones in others Models cannot always recreate exactly the real-world experiment In order to carry out test efficiently researchers will need specialist knowledge… …of mechanical engineering/materials science/reactor physics Most researchers who are specialists in one discipline will need to retrain/extend their studies… …which costs money Not every possible variable may be included in the model… …leading to inaccurate results. Allow one mark for a reasoned conclusion.	**8**

Question	Answer	Marks
13	***Four*** *from:* Example of appropriate title Appropriately labelled sectors including example Percentages attached to sectors including examples Number of students taking each course in each sector including examples Different colour sectors Description of chart legend including example.	**4**

Question	Answer	Marks
14	***Eight*** *from:* Inclusion of all fields mentioned in question Must be text boxes or individual character boxes Title space bigger than author, ISBN and borrower number similar size and generally sensible spacing Drop down dates for date borrowed or clear view of calendar Radio buttons for borrowed (Y/N) Navigation buttons Help button/information on how to complete the form Appropriate title Appropriate white space and information fills the page.	**8**

Question	Answer	Marks
15(a)	Customer record table Sales record table  All customer records and Sales records data with correctly titled tables 1 mark Primary key fields identified 1 mark Relationship line between correct two fields 1 mark One to many indicated 1 mark	**4**
15(b)	***Four*** *from:* Customer_id is identified as the primary key in the customer record table and Invoice_number as the primary key in the Sales record table Add these two tables in the relationships view/option Select Customer_id in customer records table and connect it to Customer_ref in the Sales records table Check/select relationship type is one to many Ensure that relationship is saved.	**4**