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Cambridge International AS & A Level

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CANDIDATE NAME

CENTRE NUMBER | | | | | |

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7811632120

INFORMATION TECHNOLOGY **9626/13**

Paper 1 Theory **May/June 2019**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

Calculators must not be used on this paper.

Any businesses described in this paper are entirely fictitious.

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1 Tick the **four** most accurate statements regarding solid state drives (SSDs), hard disk drives (HDDs), magnetic tape drives and their associated media.

	✓
Hard disks are metal platters with a magnetic coating that stores data	
Hard disk drives have no moving parts and so are not at risk of being damaged	
Magnetic tape drives can have almost instantaneous data access	
SSDs have a faster data transfer rate than magnetic tape drives	
Magnetic tape uses direct access to search for data	
Magnetic tapes are used in laptop computers more than hard disks	
SSDs store considerably more data than magnetic tapes	
SSDs still cost more per gigabyte than hard disk drives	
SSDs make more noise than the sound of hard disk drives when in use	
Magnetic tapes are used to store backups of data on file servers	

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2 Tick the **four** most accurate statements regarding control and monitoring systems and the use of sensors.

	✓
A temperature sensor is able to directly control the temperature of water in a washing machine	
A pressure sensor is often used to monitor the amount of pollution in a river	
A moisture sensor is used to monitor the pollution in a river	
A humidity sensor is often used in a computerised weather station	
Microprocessors are unable to directly read the analogue data produced by a sensor	
In order to control physical variables, microprocessors send signals to actuators to take action	
Passive sensors produce both input and output	
A weather station is an example of a control system	
An air conditioning system is an example of a control system where the output affects the input	
Monitoring systems never need sensors to input data	

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3 Using a printed newspaper as an example, describe what is meant by static data.

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4 The quality of a sound recording when processed by audio editing software depends on the sampling resolution of the recording.

Describe, using examples, what is meant by sampling resolution and explain how it affects audio file sizes.

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5 A headteacher is updating the school's record-keeping system. For the new system he is considering using off-the-shelf software. When the new system is running the secretary will need to enter all the students' data. This will require accurate entry of the data.

(a) Define what is meant by the term 'software' and describe, giving examples of each, application and system software.

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(b) Describe the benefits of using off-the-shelf software.

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(c) Describe the drawbacks of using off-the-shelf software.

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(d) Describe the different methods of verification the secretary could use.

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6 Spreadsheets are commonly used to create models of real situations.

Using examples, explain why the characteristics of spreadsheets are suitable for producing financial models.

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7 The encoding of data can often require the use of codecs.

Describe the features of this type of encoding.

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8 A car hire company keeps its records in a database consisting of two tables. Parts of these tables are shown below.

Customer Table

CustomerID	FamilyName	FirstName	Phone	Residence
11106	Akula	Angela	01164 960567	Midtown
12481	Onyancha	Udoka	08081 960965	Cheswick
12675	Smith	Wesley	07700 900863	Portlarne
12934	Hall	Lauren	01134 960675	Chorlton
12943	Green	Billy	01164 960001	Midtown
13296	Jones	Trevor	01134 990694	Chorlton
13478	Weston	Wally	07700 900900	Portlarne
13542	Gunn	Jasmine	08081 570945	Cheswick
14632	Wells	Brian	09098 790142	Larrowby
15692	Williams	Ieuan	01164 960836	Midtown
15732	Vercoe	John	09098 980487	Larrowby

Car Table

ID	Make	Model	Engine	Licence	Price	Rental	CustId
1	Olep	Victor	1.8	VSE 648	€19,000	€54	12481
2	Olep	Victor	1.8	VTF 384	€19,000	€54	13478
3	Olep	Fariza	2	BFK 297	€29,000	€63	15692
4	Folkwagon	Cricket	1.4	SB A5526	€15,000	€43	14632
5	Folkwagon	Cricket	1.4	SA V4428	€15,000	€43	13296
6	Folkwagon	Swim	1.2	DD B4978	€11,000	€37	15732
7	Folkwagon	Swim	1.2	DD C8634	€11,000	€37	12934
8	Folkwagon	Piano	1.6	B G8347	€19,000	€49	11106
9	Ranolt	Melanie	1.4	12333 CD 33	€17,000	€41	12943
10	Ranolt	Laine	1.2	6289 XF 54	€11,000	€33	13542
11	Ranolt	Laine	1.2	6301 YU 38	€11,000	€33	12675

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(a) Describe how you would use database features to create a relational database from these two tables.

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(b) The manager is carrying out a survey of cars hired in certain areas. She wishes to know which cars with an engine size under 1.8 litres have been rented by people living in the Chorlton area. She only wishes to know the full names of the customers, their phone number and the make of the car.

Complete the grid below to show how the conditions for such a query would be created.

Field:						
Table:						
Sort:						
Show:	☐	☐	☐	☐	☐	☐
Criteria:						
or:						

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(c) Explain why it would be extremely difficult to validate the Licence field. Include in your explanation, a detailed description of **three** validation checks, other than a presence check, which could normally be used on any alphanumeric field from the database shown on page 8.

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9 Below is a spreadsheet of a company's balance sheet. It shows its expenditure, income and profit for each year between 2009 and 2018.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2			Expenditure										
3			Wages	Utilities	Stock		Total expenditure		Income		Profit		
4	2009		350250	54565	475623		€880,438		€925,365		€44,927		very bad year
5	2010		467032	61022	519429		€1,047,483		€1,097,652		€50,169		bad year
6	2011		476414	68124	567178		€1,111,716		€1,185,858		€74,142		bad year
7	2012		512209	75936	619224		€1,207,369		€1,342,020		€134,651		good year
8	2013		553156	84530	675954		€1,313,640		€1,518,483		€204,843		good year
9	2014		648589	93983	737790		€1,480,362		€1,717,886		€237,524		good year
10	2015		732877	104381	805191		€1,642,449		€1,943,211		€300,762		good year
11	2016		774954	115819	878658		€1,769,431		€2,197,828		€428,397		good year
12	2017		838925	128401	958737		€1,926,063		€2,485,546		€559,483		good year
13	2018		868577	142241	1046023		€2,056,841		€2,810,667		€753,826		good year
14													
15			>2011	<2017									
16													
17		Variable average	644357										
18													

(a) Write down the formula which uses a function, in cell G4, to calculate the *Total expenditure* for 2009.

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(b) The percentage profit is calculated by dividing the *Profit* by the *Income*. The company secretary has entered a formula in M4 which displays a message:

- very bad year, if *Income* was less than €1,000,000
- bad year, if the company's percentage profit was less than 10%
- good year, if the percentage profit was not less than 10%

Write down the formula he used in cell M4 which would be replicated in cells M5 to M13.

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You can use the space below for any working you need.

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(c) The manager wants to be able to find the *Variable average* of the wages bill for any sequence of years between 2009 and 2018.
He has set up the spreadsheet to calculate the average between 2011 and 2017.
To calculate the average between any other sequence of years he will just change the conditions >2011 and <2017.

Write down the formula he will need to use in C17 to calculate the *Variable average*.

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You can use the space below for any working you need.

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10 Discuss the advantages and disadvantages of client-server and peer-to-peer networks.

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11 A business needs to search its database to find all the customers it has in the Chinese city of Beijing.

Analyse when static or dynamic parameters should be used in queries.

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