

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE O Level

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MARK SCHEME for the October/November 2013 series

7010 COMPUTER STUDIES

7010/13

Paper 1; maximum raw mark 100

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

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1 (a) Any **three** from:

- data should be obtained/processed fairly/lawfully
 - data should be obtained only for one or more specified purposes
 - data should be adequate/relevant/not excessive (in relation to its purpose)
 - data should be accurate/up to date
 - data should be held no longer than necessary (for the purpose for which it was obtained)
 - data should be processed in accordance with the rights of the data subjects
 - data should be kept securely/safely (with adequate levels of protection)
 - data should only be transferred to countries with an adequate level of protection (safe harbour)
 - data subjects have the right to see data about them and/or have it altered/removed if incorrect
- [3]

(b) **Personal data:** any **two** from:

e.g.

- name (surname and/or forename)
- address
- telephone/mobile number
- passport/id number
- date of birth
- email address

Sensitive personal data: any **two** from:

e.g.

- racial/ethnic origin
- political opinions
- religious beliefs
- Trades Union membership
- physical/mental health
- sexual life/orientation
- criminal convictions

[4]

2 (a) Any **two** from:

- user can work at their own speed
- user can learn in their own time/when/where they want
- user can re-run sections of training package whenever they wish
- user can pause the training at any point
- user gets immediate feedback/analysis (on their performance)
- there is no need to have teachers or classrooms
- less expensive for the airline/ training department

[2]

(b) (i) flight simulator/simulating/simulation

[1]

(ii) Any **two** from:

- can be much safer
- less expensive than building/crashing the real thing
- repetition of scenarios (e.g. potential crashes)
- different scenarios/situations available
- no need for an instructor

[2]

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3 (a) Any **three** from:

- satellites transmit signals (to the GPS in the car)
- the computer receives/interprets these signals
- the system depends on very accurate timing/atomic clocks
- each satellite transmits its location and time
- computer in the vehicle calculates its position based on at least 3 satellite signals
- system makes use of triangulation (to pinpoint its exact location)
- position of vehicle accurate to within 1 metre
- at least 24 satellites in operation

[3]

(b) (i) **benefits** (any **one** from)

- safer because e.g. driver can keep their eyes on the road
- verbal instructions can be easier/quicker to understand by driver
- a comparative safety issue

drawbacks (any **one** from)

- can be distracting to the driver
- may not hear instructions (clearly)
- inappropriate words

[2]

(ii) Any **two** from:

- maps in GPS (sat nav) may be out of date/new road
- position of the car is in error
- fault in software in device
- interference/loss of signal e.g. due to weather

[2]

4 (a) Any **two** from:

- hackers only get part of the password
- can ask for different characters/combinations each time
- helps to “defeat” spyware

[2]

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(b) Any **three** from:

customer knows:

e.g.

- PIN
- Name/user name
- date last logged on
- memorable word/phrase/graphic
- memorable personal data e.g. mother's maiden name
- date of birth
- email address
- recent activities
- telephone number
- customer number
- account number

belongs to customer:

- bank card (number)

unique to customer:

- biometrics (e.g. fingerprints) [3]

5 (a) (i) Any **one** from:

- touch screen
- mouse/trackerball/touch pad
- keyboard [1]

(ii) Any **one** from:

- touch required element on screen with finger (and go to relevant web page)
- pointer moved and element selected (mouse/trackerball/touch pad)
- use arrow keys on keyboard to select required element and then press [ENTER] key OR key characters and press [ENTER] [1]

(b) Any **two** from:

- much faster/easier to access information
- more up to date (since easier to modify than books)
- more convenient than carrying around many text books
- many people can access the data at the same time
- using multi-media (possible to improve learning environment)
- easier to import information into an "essay" (for example) [2]

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(c) Any **two** from:

- Accuracy issues e.g. anyone can write a web page, information is limited to author's
 - health and safety risks from prolonged use of computer
 - risk of finding undesirable web sites
 - possibility of information overload when doing searches
 - Internet access required
 - Power source required
- [2]

6 (a) Any **three** from:

- sensors for oxygen, heart/pulse rate (etc.) send signals to computer
 - converted (by ADC) into digital data
 - computer compares this data with stored data/pre-set values
 - sends vital signs data to monitors
 - if the new information is out of range, computer sends signals
 - to sound an alarm/warn doctors and nurses
 - signals need to be first converted into analogue (by DAC)
 - monitoring is continuous (until machine is switched off)
- [3]

(b) Any **two** from:

- nurse issues e.g. nurses get tired, need breaks
 - can show immediate trends (automatically)
 - faster response to a given set of conditions
 - less expensive because e.g. leaves nurses free to do other tasks while computer monitors patients, less wages
- [2]

(c) Any **two** from:

- easier to see immediate trends in data using a graph
 - "OK" graph and "not OK" graph may be easier to recognise at a glance
 - numbers are easier to read in some cases (e.g. temperature)
 - no need to interpret/understand numbers
- [2]

7 (a) Any **two** from:

- data sent in a compressed form
 - over the Internet
 - displayed to user in real time
 - makes use of buffering
- [2]

(b) **true** (any **one** from)

- information sent straight to user's computer
- no need to save information first on servers' hard disk
- data is live (in real time)

on demand (any **one** from)

- files saved on servers' hard disk first
 - then played back to user as required
- [2]

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(c) **software** (any **one** from)

- media player
- decompression software
- CODEC

temporary storage

- use of buffers [2]

(d) **benefit** (any **one** from)

- no need to store the files/saves on memory space
- can be sent directly to any receiving device
- available anytime

drawback (any **one** from)

- slow due to e.g. buffering, broadband speed
- video “gaps”/jumps as data is streamed
- video withdrawn [2]

8 (a) **Advantages** (any **two** from)

- easier to modify the drawings
- can keep a “library of parts”
- special features available e.g. zoom, rotation
- can do automatic costings
- easier to create a model from the design
- easier to do ergonomic studies on new designs
- can automatically carry out stress/loading calculations
- direct link into CAM is possible

Disadvantages (any **two** from)

- possible need for training
- higher costs e.g. start-up, on-going [4]

(b) (i) **benefits** (any **two** from)

- reduced costs in countries where labour costs are lower
- reduced costs in countries where incentives are given to set up companies
- round the clock (24/7) customer support is possible
- if workers on strike in one country, can move work somewhere else [2]

(ii) **drawbacks** (any **two** from)

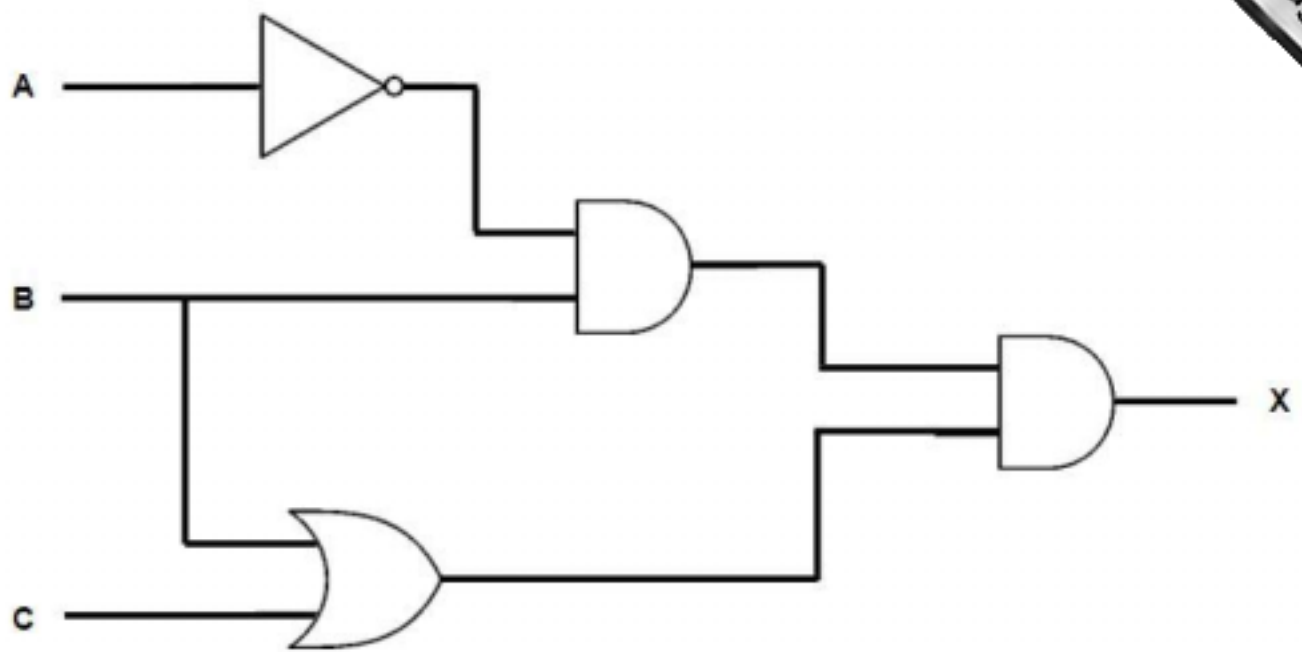
- language and culture problems can make it difficult for company
- possible negativity to overseas call centres (loss of customers)
- need for (expensive) training programmes
- start-up costs
- possible unreliability of infrastructure [2]

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- 9 (a) 8
- (b) (i) 1515
1801
(–1 mark for each error) [2]
- (ii) – checks whether new goods have (yet) to be ordered
– to maintain stock levels [1]
- (c) (Price of item (\$) > 2) OR (Value of stock (\$) > 300)
<----- 1 mark -----> <----- 1mark ----->
or
(Value of stock (\$) > 300) OR (Price of item (\$) > 2)
<----- 1 mark -----> <----- 1mark -----> [2]
- 10 (a) (i) – value of count starts at 1 so only 999 iterations
– value of count reaches 1000, but before 1000th input
- (ii) – line 1 should read **count = 0**
– line 5 should read **count = 1001** (or **count >1000**)
– change to appropriate loop structure [2]
- (b) – 1 mark for naming data type + 1 mark for example related to month
– normal/valid (test data)
– any value in given range (1 to 12) e.g. 4
– abnormal/invalid (test data)
– any value which is outside the range/any value not acceptable
– i.e. letters, negative numbers, values > 12 e.g. adfrk, -20, 36
– extreme/boundary (test data)
– data which is on the boundaries/edges of the acceptable range
– i.e. 1 or 12 for extreme; 0, 1, 12 or 13 for boundary
– Month names, instead of values, are acceptable e.g. April [6]

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11 (a)



(1 mark for EACH correct logic gate)

[4]

(b)

A	B	C	X	
0	0	0	0	} 1 mark
0	0	1	0	
0	1	0	1	} 1 mark
0	1	1	1	
1	0	0	0	} 1 mark
1	0	1	0	
1	1	0	0	} 1 mark
1	1	1	0	

[4]

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12 (a)

	E
1	Average (\$/litre)
2	= AVERAGE (B2:D2)
3	= AVERAGE (B3:D3)
4	= AVERAGE (B4:D4)
5	= AVERAGE (B5:D5)
6	= AVERAGE (B6:D6)
7	= AVERAGE (B7:D7)
8	= AVERAGE (B8:D8)
9	= AVERAGE (B9:D9)

-1 for each error

Working equivalents acceptable

Allow follow through

[2]

(b) MAX (D2:D9)

[1]

(c) (i) Y or “Y”

(ii)

	F
	Above world average in year 3?
1	Y
2	Y
3	Y
4	Y
5	N
6	Y
7	Y
8	Y
9	N

} 1 mark

} 1 mark

[2]

(d) (i) 5

[1]

(ii) = COUNTIF (F2:F9, “Y”)

[1]

13 (a) (52, 14)

1 mk 1 mk

[2]

(b) B

[1]

(c) (i) – smallest element that makes up a picture
 – short for *picture element*

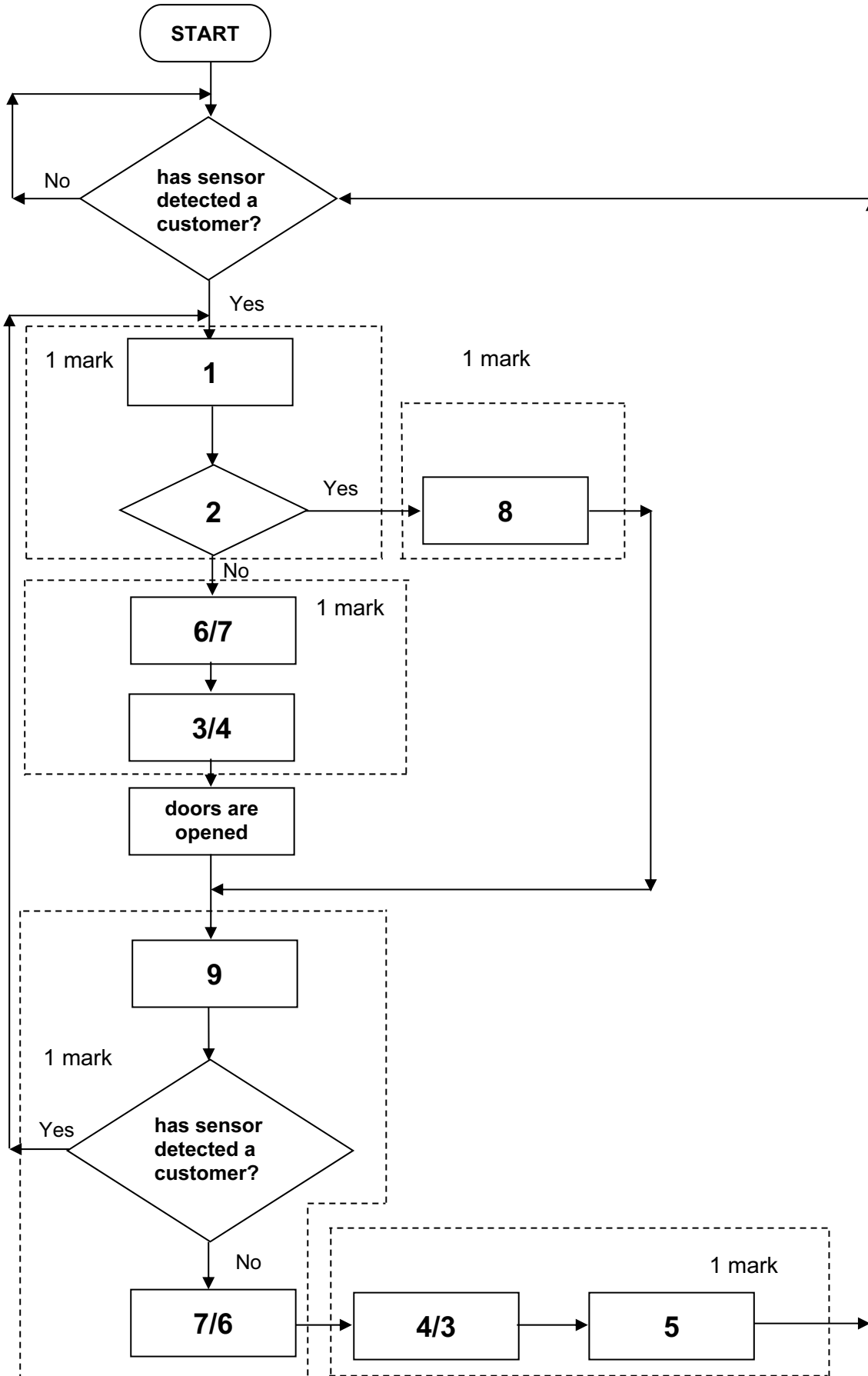
[1]

(ii) 128 × 64 = 8192 bytes of memory
 = **8 kilobytes**

(2 marks for correct answer, 1 mark for good attempt at calculation)

[2]

14



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15 marking points:

- initialisation 1 mark
- correct loop structure (1 to 5000) 1 mark
- input numbers (INSIDE a loop) 1 mark
- test for how many digits in all input numbers 1 mark
- increment all relevant totals 1 mark
- increment error total as appropriate 1 mark
- calculate % errors in input numbers 1 mark
- output ALL four totals + percent value (OUTSIDE a loop) 1 mark

sample coding:

```
single = 0: two = 0: three = 0: four = 0: error = 0 1 mark
for x = 1 to 5000 1 mark
  input number 1 mark
  if number > 999 and number < 10000 then four = four + 1 }
  else if number > 99 then three = three + 1 } 2
  else if number > 9 then two = two + 1 } marks
  else if number > 0 then single = single + 1 }
  else error = error + 1 1 mark
next x
percent = error/50 1 mark
print single, two, three, four, percent 1 mark
```