CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

7010 COMPUTER STUDIES

7010/13   Paper 1, maximum raw mark 100

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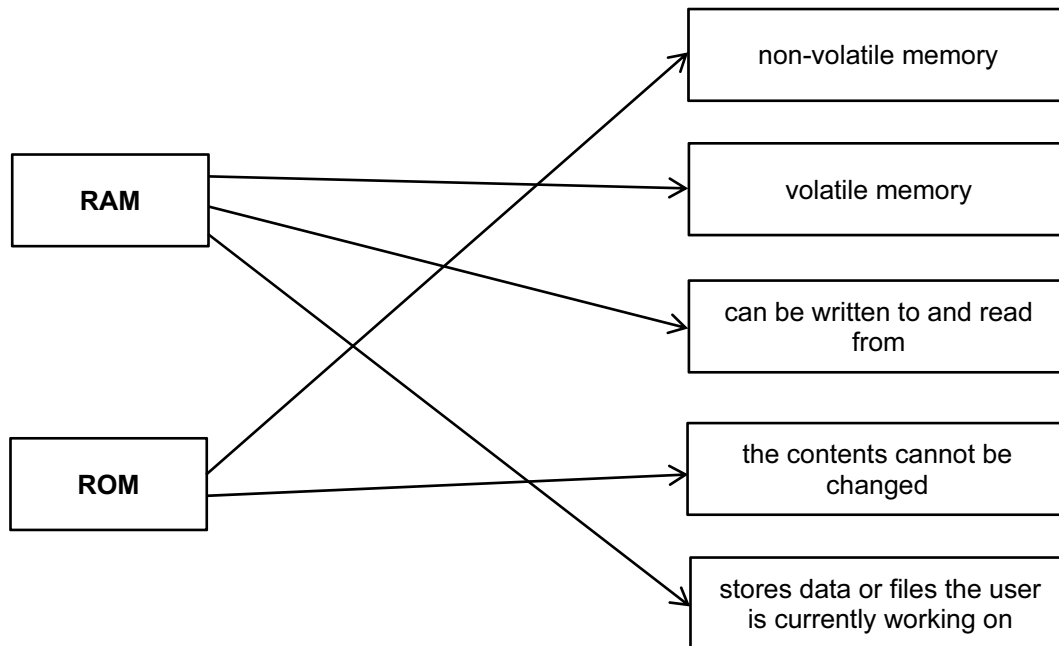**CAMBRIDGE**
International Examinations

1   Any **three** from (need risk + reason):

    Safety issues e.g.:
    - electrocution from bare wires or spilling liquids on live equipment
    - trip hazard due to trailing wires
    - risk of heavy equipment falling from inadequate desks
    - risk of fire if insufficient equipment ventilation or overloaded wall sockets

[3]

2

    1 mark for each correct line (**max 5**)
    Deduct 1 mark for each additional incorrect line.

[5]

3   (a) FALSE   – encryption only stops data being read / making sense (but does not prevent the act of hacking)

        FALSE   – data when backed up could still have the virus attached to it
                – when the backed up data is re-loaded at a later date, the virus could be loaded again into the system together with the stored data

        TRUE   – tapping into a Wi-Fi network is relatively easy (even when the network is protected by passwords)

        1 mark for each correct TRUE / FALSE with correct corresponding reason

[3]

(b) (i) drop down boxes help defeat spyware / key logging software   **[1]**

    (ii) – to ensure that it was in fact Felipe who logged on <u>last time</u>   **[1]**
         – an additional authentication check

    (iii) in case it is not Felipe who attempts to access the account

                                                                         [1]

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

    – Expert System asks questions
    – Rikki inputs the answers to the questions
    – next question asked is based on previous response(s)
    – search <u>Knowledge Base</u> ……
    – ….. uses the <u>Rules Base</u> to draw conclusions
    – use of <u>Inference Engine</u>
    – <u>probable</u> faults / solutions output on a screen
    – … and the % probability of accuracy is also given

                                                                          [3]

(b) Any **two** from:

    – security purposes as these files are needed to access the Expert System
    – licence agreement to only allow an authorised number of computers to access Expert System
    – the extra files need to be accessed for the Expert System to work

                                                                           [2]
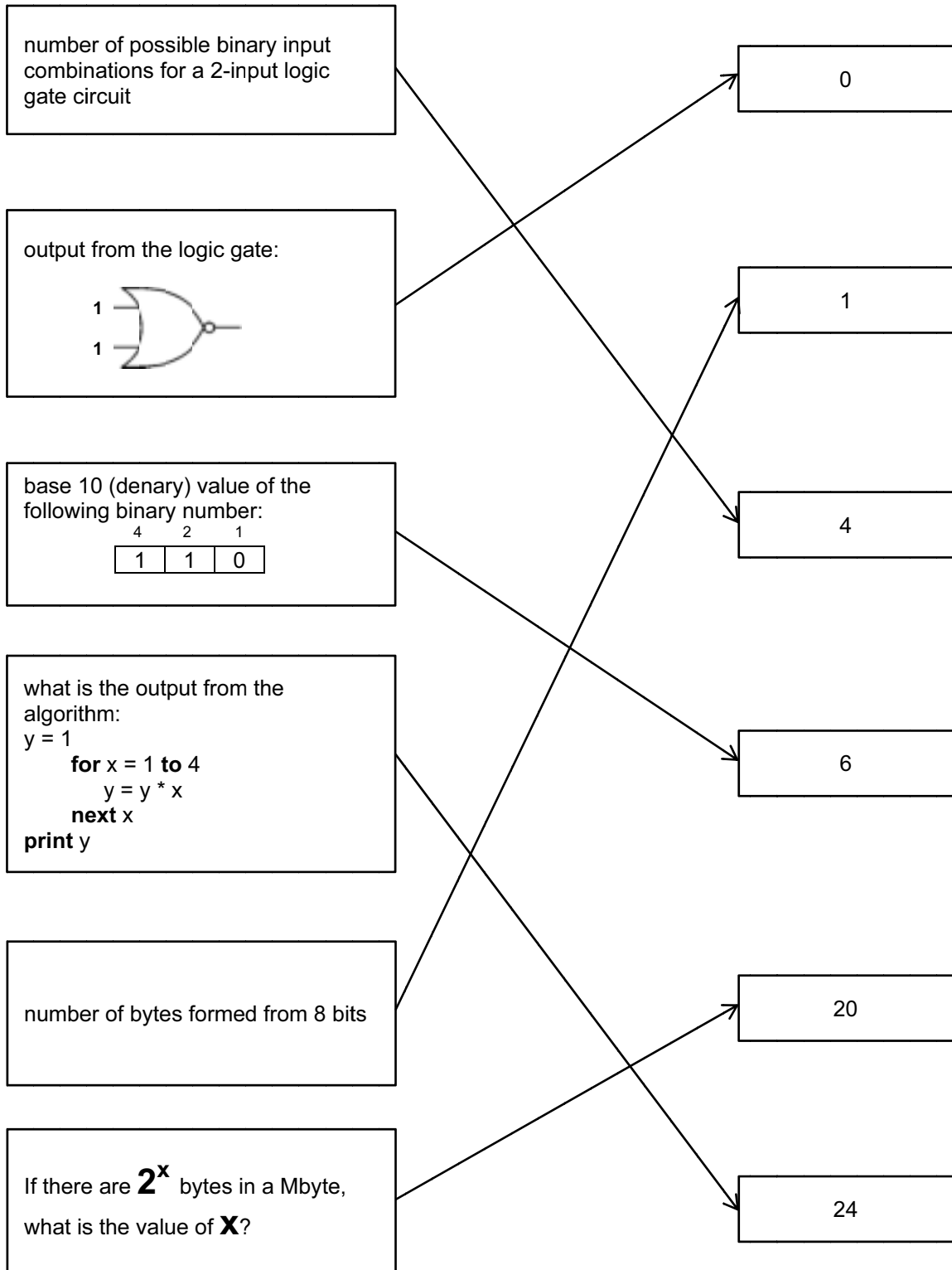
(c) Any **one** from:

    – chess games
    – oil / mineral prospecting
    – tax calculations
    – weather forecasting
    – identify plants / animals/chemical compounds
    – careers guidance
    – car engine tuning

                                                                           [1]

5

number of possible binary input combinations for a 2-input logic gate circuit		0

output from the logic gate:		1

base 10 (denary) value of the following binary number:		4

what is the output from the algorithm:
y = 1
    for x = 1 **to** 4
      y = y * x
    next x
print y

6

number of bytes formed from 8 bits		20

If there are 2^x bytes in a Mbyte, what is the value of X?		24

1 mark for each correct line **(max 5)**

[5]

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6 1 mark for each error located with corresponding correction (description or corrected pseudocode acceptable)

error:	line 10: sum not initialised
correction:	sum = 0
error:	line 40: incorrect formula for sum
correction:	sum = sum + n
error:	line 50: incorrect IF statement
correction:	IF sum > 50 THEN ……
error:	lines 50 and 60: value of count causes a problem e.g. loop never ending
correction:	**either** count = 19 on line 50
	or count = count + 1 between lines 30 and 40
	or any other correct solution
error:	line 80: output of n is incorrect
correction	**output** sum or **print** sum

[5]

7 (a) wikis [1]

(b) social networking sites [1]

(c) podcasts [1]

(d) tagging [1]

(e) blogs

[1]

8 (a)

d	u	u	l	a	f	x		n	a	c	c		x	e		o	y	u	o	v	.

< - - - - - - - - - - - - - - 1 mark - - - - - - - - - - - - - ->   <- - - - - - - - - - 1 mark - - - - - - - - ->

[2]

(b)

c	o	m	p	u	t	i	n	g		i	s		f	u	n	.

<- - - - - - - - - - - - - 1 mark - - - - - - - - - - - - ->   <- - - - - - - - - - 1 mark - - - - - - - - ->

[2]

(c) Any **three** from:

- customers need a password / PIN
- use of card readers / use of Transaction Authentication Number (TAN)
- only certain characters from password / PIN requested…
- …the requested characters change each time user logs on
- card security code requested
- use of drop down boxes
- use of a customer reference number
- inform customer when they last logged on to the website
- use of <u>image</u> verification code e.g. CAPTCHA
- make reference to something unique to the customer e.g. their mobile phone number
- use of secure protocol e.g. https, padlock symbol

[3]

9 (a) 1 mark for input device + 1 mark for its <u>matching</u> use

input device:	touch screen
use:	select film / cinema seats / price

input device:	keyboard / keypad
use:	input number of tickets / card PIN

input device:	magnetic stripe reader / chip and PIN reader / card reader
use:	reading credit / debit card details

input device:	scanner
use:	to read any promotional vouchers (etc.)

[4]

(b) 1 mark for each different output device + 1 mark for its <u>matching</u> use

output device:	screen / monitor
use:	show films available / seating plan / prices of each seat / payment details

output device:	printer
use:	print receipt / tickets

output device:	loudspeaker / beeper
use:	to indicate error in input / confirmation of keys pressed

[4]

10 (a) 1 mark for each different sensor (**max 2**)

- pressure sensor
- example of sensor to detect if door closed / open e.g. magnetic field sensor, proximity sensor
- moisture / humidity sensor
- temperature / infrared sensor

[2]

(b) 1 mark for each item of data (**max 2**):

– is the food frozen / uncooked / cooked?
– <u>cooking</u> time
– start / end time
– power
– weight
– type of food
– additional cooking feature e.g. browning

1 mark for each corresponding input method (**max 2**):

– turn dial to select option
– touch screen / buttons / concept keyboard / keypad to select options
– use of barcode readers (to read barcodes on food packaging which stores an automatic cooking programme)
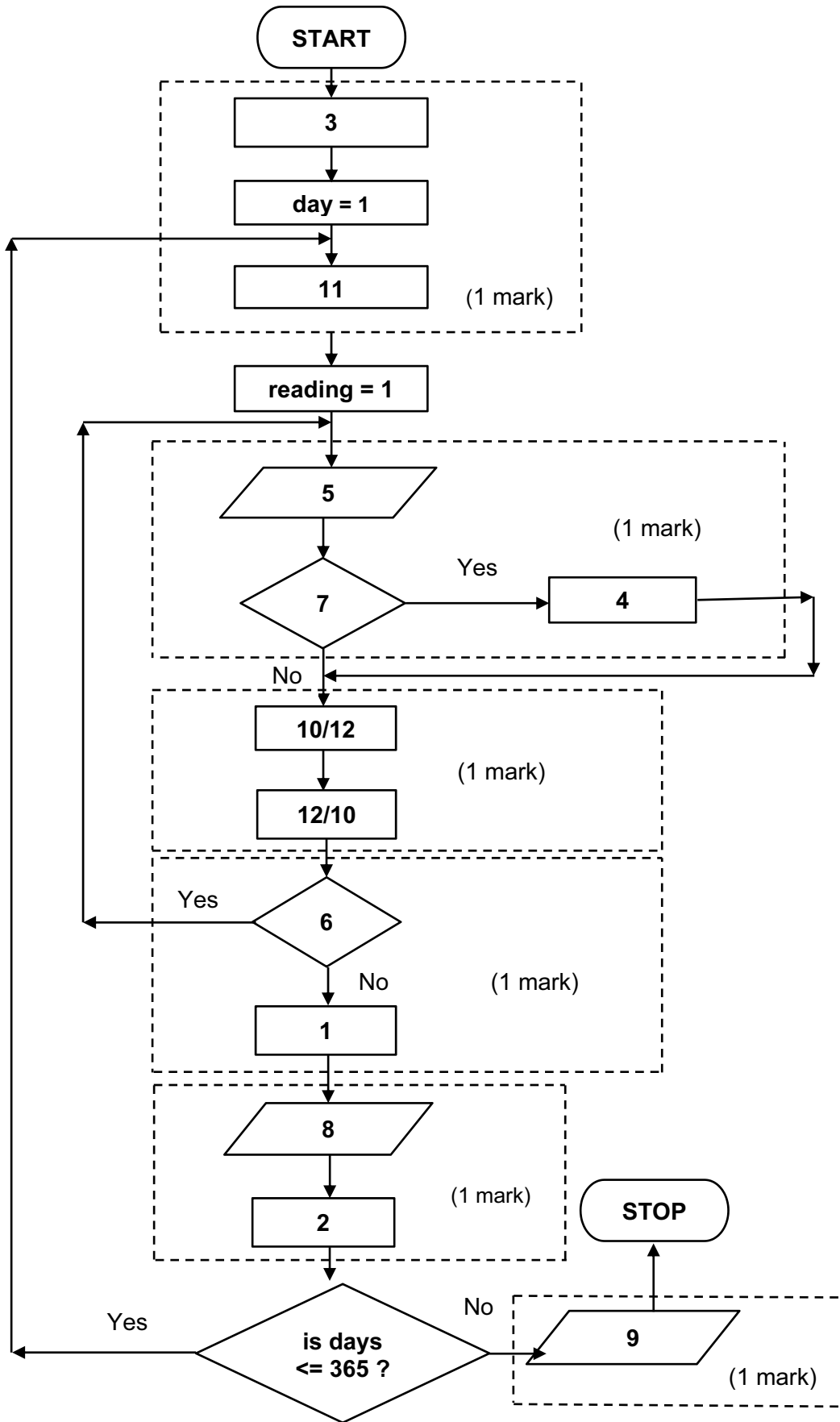
[4]

(c) Any **four** from:
– (microprocessor) checks / receives readings / data / signals from sensors….
– …..continuously
– if door open, (microprocessor) sends signal to sound alarm / stop process
– (microprocessor) compares weight of food against stored values…
– …and automatically sets cooking time / power
– cooking time controlled by (microprocessor) comparing with stored values
– (microprocessor) sends signal to beeper / notify when cooking program complete

[4]

11

START

3

day = 1

11   (1 mark)

reading = 1

5

(1 mark)

7   Yes   4

No

10/12

(1 mark)

12/10

Yes   6

No   (1 mark)

1

8

(1 mark)

2

STOP

is days
<= 365 ?   No   9

Yes   (1 mark)

[6]

1

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12 (a) (i) B3 / B2   (1 mark)

(ii) (B5 / C4) * 2 or = ((B5 * B2) / B3) * 2   (1 mark)

[2]

(b) = IF(C6>D1, "above", "equal or below")
          ↔   ↔
      1 mark 1 mark

OR

= IF(D1<C6, "above", "equal or below")
          ↔   ↔
      1 mark 1 mark

Alternative word(s) for "above" are acceptable.

[2]

(c) C4, C6, D6

[1]

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13 (a)

T1	T2	T3	A	B	C	OUTPUT
0	0	0				
			3	2	1	
1						
	1		4	8	7	
2			6	0	3	
		1	5	6	9	
	2		4	11	3	
			0	0	0	
						2, 2, 1

     1 mark   1 mark   1 mark   < - - - - - - - - - - 1 mark - - - - - - - - - - - ->   1 mark

If no marks are awarded for the columns then 1 mark can be given for correct initialisation of T1, T2 & T3 as shown in the first row above.

[5]

(b) – any data set (except 0, 0, 0) where 2/3 of the numbers are the same e.g. 2, 8, 8
    – flowchart does not allow for numbers which have the same value

[2]

14 (a) Row number:

	1	2	3	4	5	6	7
Reg 1:	0	1	1	0	0	0	0
Reg 2:	1	0	0	1	0	0	1
Reg 3:	1	0	0	1	0	1	0
Reg 4:	1	0	0	1	1	0	0
Reg 5:	0	1	1	0	0	0	0

Reg 1 + Reg 5 = 1 mark
Reg 2 = 1 mark
Reg 3 = 1 mark
Reg 4 = 1 mark

[4]

(b)

	8
Reg 1:	0
Reg 2:	0
Reg 3:	1
Reg 4:	1
Reg 5:	0

Reg 2 + Reg 5 = 1 mark
Reg 3 = 1 mark
Reg 4 = 1 mark

[3]

15 (a)

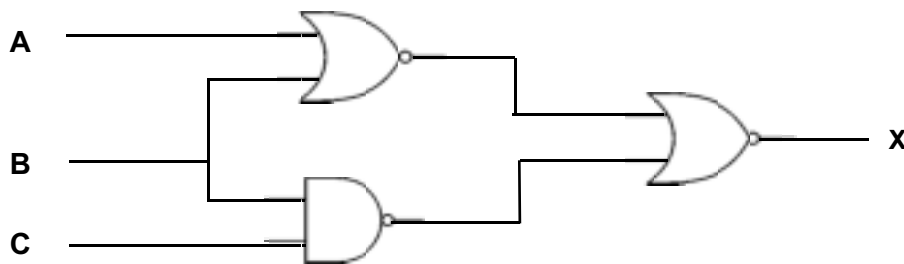| A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

1 mark

1 mark   **[4]**

1 mark

1 mark

[4]

(b) 1 mark for correct NOR gate and 1 mark for correct NAND gate in correct positions on left hand side of diagram.

[2]

(c) [A = **NOT** 1 **OR** B = **NOT** 1]   1 mark
AND   1 mark
[B = 1 **AND** C = **NOT** 1]   1 mark

Other notations which are acceptable:

(NOT A OR NOT B) AND (B AND NOT C)

$(\overline{A} + \overline{B}) \, . \, (B \, . \, \overline{C})$

(A' + B') . (B . C')

[3]

16 **Marking points:**

- initialise largest and two totals
- control loop for 1000 items
- check if price 1 > price 2 and increment total 1 (inside loop)
- check if price 2 > price 1 and increment total 2 (inside loop)
- calculate price difference (inside loop)
- method of dealing with negative difference
- check if calculated difference > largest difference and action taken if it is
- three outputs OUTSIDE a loop (calculation must have been attempted)

Sample program in pseudocode:

```
largest = 0
smarket1 = 0: smarket2 = 0                              1 mark
for item = 1 to 1000                                    1 mark
    input price1, price2
    if price1 > price2 then smarket1 = smarket1 + 1     1 mark
    if price2 > price1 then smarket2 = smarket2 + 1     1 mark
    difference = price1 – price2                        1 mark
        if difference < 0 then difference = - difference   1 mark
        if difference > largest then largest = difference  1 mark
next item
output smarket1, smarket2, largest                      1 mark

                                                        (max 6)
```

[6]