

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

7010 COMPUTER STUDIES

7010/12

Paper 1, maximum raw mark 100

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1 Any **three** from:

- (provides) user interface
- input/output control
- security
- handling interrupts
- spooling
- memory management
- processor management
- utilities (e.g. copy, save, delete, re-name, etc.)
- maintain user accounts
- load/run software
- error reporting/handling
- multiprogramming
- batch processing (JCL)/real time processing
- multitasking/multiuser/multi-access
- file management

[3]

2 (a) 1 mark for way + 1 mark for reason

- | way | impact |
|--------------------------|---|
| – deskilling | – software has removed the need for some of the more traditional skills e.g. using CAD |
| – (re-)training | – work practices have changed; need to learn how to use the new software/computer |
| – redundancy | – new technology allows work to be completed by fewer staff/out-sourced to “cheaper” work forces in foreign countries |
| – work from home (etc.) | – use of emails, VoIP, video conferencing, instant messaging, etc. allows working away from the office |
| – nicer/safer work place | – quieter (no noisy typewriters) and safer (no heavy filing cabinets) |
| – health (& safety) | – RSI, headaches, backaches |

[6]

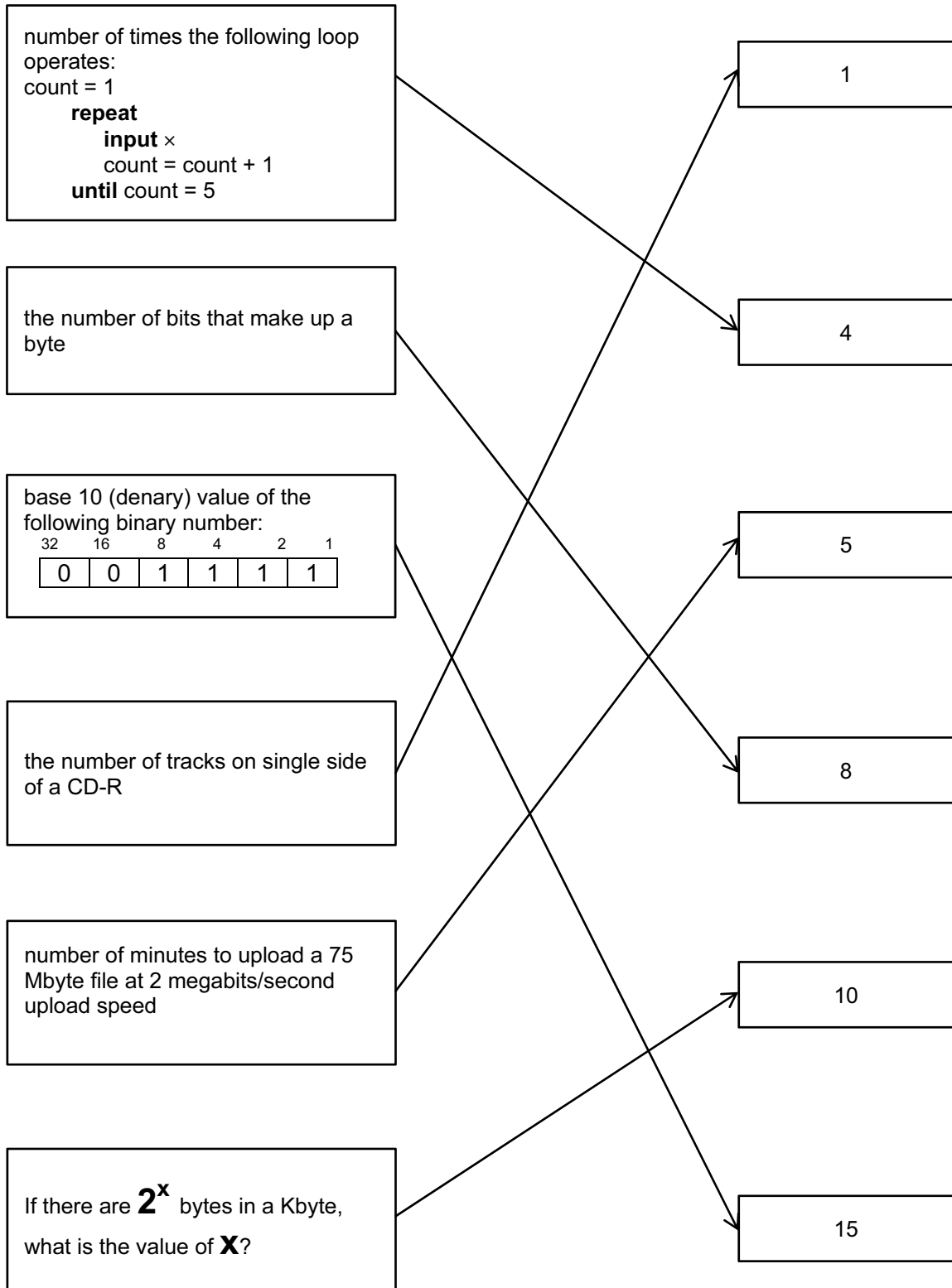
(b) Any **two** health risks from:

- RSI in wrists or fingers from prolonged typing or repeated clicking of mouse button
- headaches/eyestrain/dry eye from staring at a monitor for long periods of time/glare from monitor
- back ache/strain from sitting in same position for a long time/using chair with no adjustment

[2]

- 3 (a)** hacking [1]
(b) viruses [1]
(c) phishing [1]
(d) spyware [1]
(e) pharming [1]

4 1 mark for each correct connection up to the maximum of 5



[5]

5 (a)

<i>Sat Nav devices send signals to the global positioning satellites</i>	TRUE	FALSE
<i>Sat Nav accurately measures vehicle speed using satellite position and accurate timing</i>	TRUE	FALSE
<i>Satellites tell the Sat Nav which direction the vehicle should take</i>	TRUE	FALSE

[3]

(b) Any **two** from:

- software/maps not up to date/new road
- loss of satellite signals
- wrong data input by user (e.g. start point and end point)

[2]

6 (a) 1 mark for each error and suggested correction (accept description or example of corrected pseudocode).

- error:** line 10: total = 1
correction: totals should be set to zero; total = 0
- error:** line 30: ... number < 10 ...
correction: check should be made if number > 10; ... number > 10 ...
- error:** no input inside loop
correction: **input** number
- error:** line 50: x = x + 1
correction: **for ... to** loops don't need a counter; remove line 50 altogether
- error:** line 80: **output** x
correction: output should be total value; **output** total

[5]

(b) division by zero error (or similar description of error produced when dividing by 0)

- add an error trap after input of number
e.g. 40 **if** number = 0 **then** k = 0 **else** k = x/number

[2]

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- 7 (a) (i) – higher quality photos
– when “blown up” less likely for photo to “pixelate” [1]
- (ii) – uses up more memory (on card)
– takes longer to upload/download a photo
– file size will be greater [1]
- (b) (i) – solid state memory
– flash drive
– non-volatile [1]
- (ii) – no moving parts (so more robust)
– can be removed from camera and retain its contents
– can erase contents and reuse memory card [1]
- (c) (i) – **(pic)ture (el)ement** [1]
- (ii) – **819 or 1638** [1]
- (d) Any **one** point from: e.g.
- auto flash
 - anti (hand) shake facility
 - easy deletion of unwanted photos
 - ability to “manipulate” images after they have been taken/special effects
 - “smart” operation e.g. automatically pick out objects, faces, etc.
 - auto capture [1]
- 8 (a) Any **one** from:
- infra red (sensor)
 - pressure (sensor)
 - proximity (sensor) [1]
- (b) Any **one** from:
- additional sensors used
 - door defaults to open position
 - sounds an alarm if a sensor fails [1]

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(c) Any **four** points from:

- sensors continuously send signals/data
- sensor sends signals/data sent to the microprocessor
- signal converted to digital if necessary (using ADC)
- microprocessor checks which door(s) is (are) affected
- microprocessor compares sensor reading with stored values
- if reading indicates passenger detected...
- ...microprocessor sends signal/data to actuators/motor...
- (converted to analogue using DAC)
- ...to operate motors to open doors
- microprocessor also send signal to driver's cab (automatically) to sound an alarm
- monitoring continues until system switched off

[4]

9

1 **PENDOWN**

2 **LEFT 90**

3 **REPEAT 2**

4 FORWARD 20

1 mark

5 RIGHT 90

6 ENDREPEAT

7 FORWARD 20

8 LEFT 90

9 FORWARD 20

1 mark

10 LEFT 90

11 FORWARD 20

12 RIGHT 90

1 mark

13 FORWARD 20

14 RIGHT 90

15 FORWARD 20

1 mark

16 PENUP

17 FORWARD 20

18 PENDOWN

19 FORWARD 20

1 mark

20 RIGHT 90

21 FORWARD 60

22 RIGHT 90

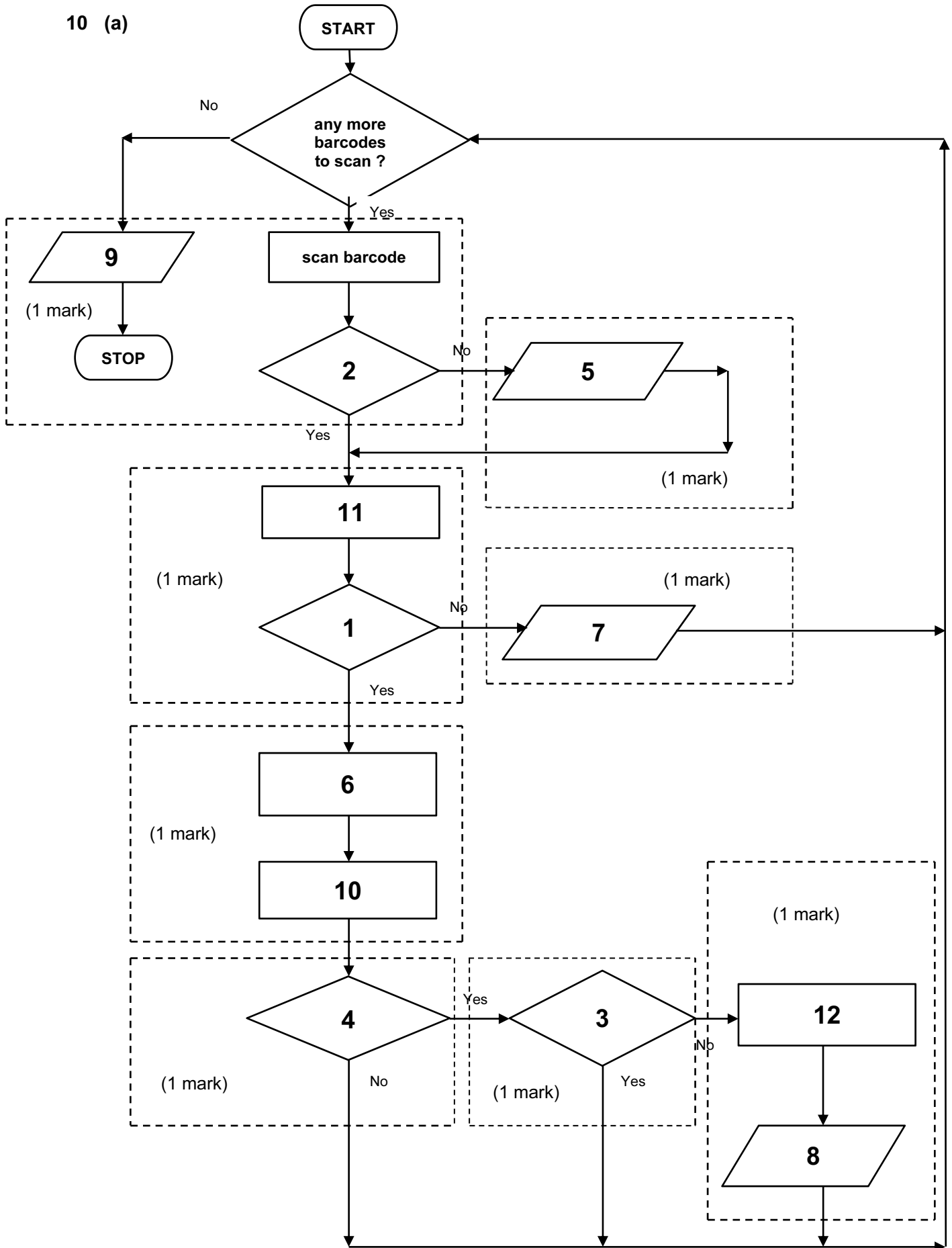
1 mark

23 FORWARD 20

[NOTE: – award 1 mark for each correct block (shown separated by dotted lines)
 – look out for alternative solutions using REPEAT/ENDREPEAT which may be correct
 – if a mistake in one of the blocks, start marking from the end awarding marks for correct blocks up to the error]

[6]

10 (a)



[8]

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(b) 1 mark for each device + 1 mark for correct matching use

device: beeper/loud speaker
 use: to indicate barcode correctly read/error in reading barcode

device: (LCD) screen/monitor
 use: to show prices and other information about goods

device: touch screen
 use: to show prices and other information about goods/to select items that need to be weighed/identified

device: weighing machine
 use: to find weight of loose items (e.g. fruit) to enable pricing

device: (magnetic) card reader/CHIP and PIN reader
 use: to read customer's debit/credit card/enable customer to pay for goods using a credit or debit card

device: printer
 use: to print receipts

(NOT keypad) [4]

11 (a) = (B2/24) * B3 [1]

(b) = C4 * B5 [1]

(c) = IF (D1 < C6, "profit", "no profit") (NOTE: accept C6 > D1 in formula)
 1 mark 1 mark [2]

(d)

	A	B	C	D
1				1500
2		18		
3		60		
4			45	
5		40		
6			1800	profit

1 mark

1 mark

1 mark

[3]

- 12 (a)** 1 mark for each of four rows shown in bold below; there are two possible ways of doing this – one set of answers is shown on the left and the alternative is shown on the right in brackets. Don't allow mix and match; answers must either be as shown on the left OR as shown on the right

0 0 0 0 0 0

0 0 1 0 0 1 (OR **0 0 1 1 0 1**) – 1 mark

0 0 0 0 0 1 (OR **0 0 0 1 0 1**) – 1 mark

0 0 0 0 0 0

0 0 0 0 0 0

0 0 1 1 0 1 (OR **0 0 1 1 0 0**) – 1 mark

0 0 0 1 0 1 (OR **0 0 0 1 0 0**) – 1 mark

0 0 0 0 0 0

[4]

- (b)** 2 marks for identifying the letter

letter: H

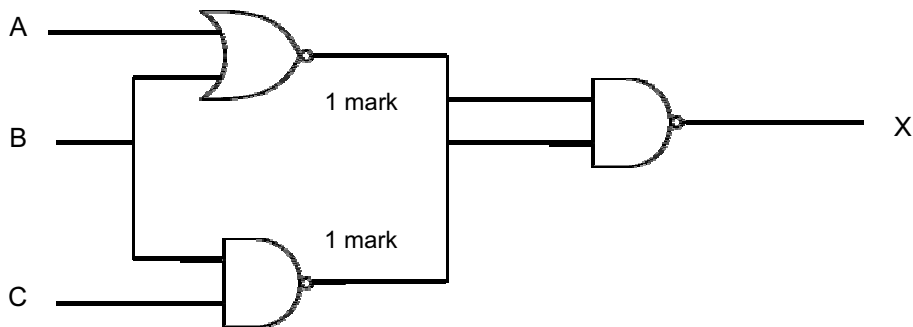
[2]

13 (a)

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	1	1 mark
1	0	1	1	
1	1	0	1	1 mark
1	1	1	1	

[4]

(b) 1 mark per correct NOR gate and NAND gate on the left (**ONLY accept two-input gates**)



[2]

(c) 1 mark per logic statement as shown below:

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

The above can be written as:

(A **AND** B) **OR** (**NOT** B **AND** C)
 (1 mark) (1 mark) (1 mark)

**Note: allow 1st part of formula and 2nd part of formula to be reversed:
 (e.g. (NOT B AND C) OR (A AND B))**

Also accept Boolean algebra:

a.b + $\bar{b}.c$ (can be written as: A.B + B.C)
 (1 mark) (1 mark) (1 mark)

[3]

14 **NOTE:** sum1, sum2 and total **MUST** be initialised for all three inputs to get the mark; allow repetition in any of the columns **EXCEPT** the OUTPUT column (e.g. sum1 can be 0, 47, 47, 47, 47, 47, 47);

sum1	sum2	total	a	b	c	d	e	f	OUTPUT
0	0	0	4	3	2	0	0	8	
47	8	55							
		44							
		33							
		22							
		11							
		0							data are OK
0	0	0	5	0	1	2	3	4	
34	16	50							
		39							
		28							
		17							
		6							
		-5							error
0	0	0	0	0	0	0	0	0	

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

[5]

15 1 mark per feature applied to text in question:

- taxi —————> cabs – search and replace feature/retype/thesaurus
- yellow —————> yellow – spell checker/retype/auto-correct
- changed —————> replaced – search and replace feature/retype/thesaurus
- translate last sentence/line – (auto-)translator English to Spanish/other language

[4]

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16 marking points:

- initialise highest value (zero or less)
- loop control for all 3000 students
- set total = 0 (to find the average) before second loop
- loop control for all 8 exams
- check if input mark higher than stored highest mark
- if input mark higher, then set highest to this new value
- find the average mark for each student (includes correct total addition)
- both outputs in the correct place
(average after inside loop, highest outside outer loop)
(must be an attempt to find both average and highest to earn this mark)

sample program:

```

highest = -1                                1 mark
for student = 1 to 3000                    1 mark
    total = 0                                1 mark
    for exam = 1 to 8                        1 mark
        input mark
        total = total + mark
        if mark > highest then highest = mark  2 marks
    next
    average = total/8                        1 mark
    output average
next
output highest                              1 mark

```

[5]