

MARK SCHEME for the October/November 2012 series

0420 COMPUTER STUDIES

0420/13

Paper 1, maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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1 1 mark for each benefit and 1 mark for each drawback

Stand alone computer:

benefits:

- sound
- animation/graphics
- no need for Internet access
- more secure (less likely to be hacked)

drawbacks:

- not up-to-date
- expensive multimedia equipment
- need to take multimedia presentation file(s) and back-up(s)

Internet website:

benefits:

- use of pop ups/pop-unders (to advertise on other websites)
- ability to use hyperlinks
- available world wide both ways

drawbacks:

- expensive to maintain a website
- Internet security issues (hacking into (company) website; phishing; pharming)
- poor Internet access can make video/sound unacceptable

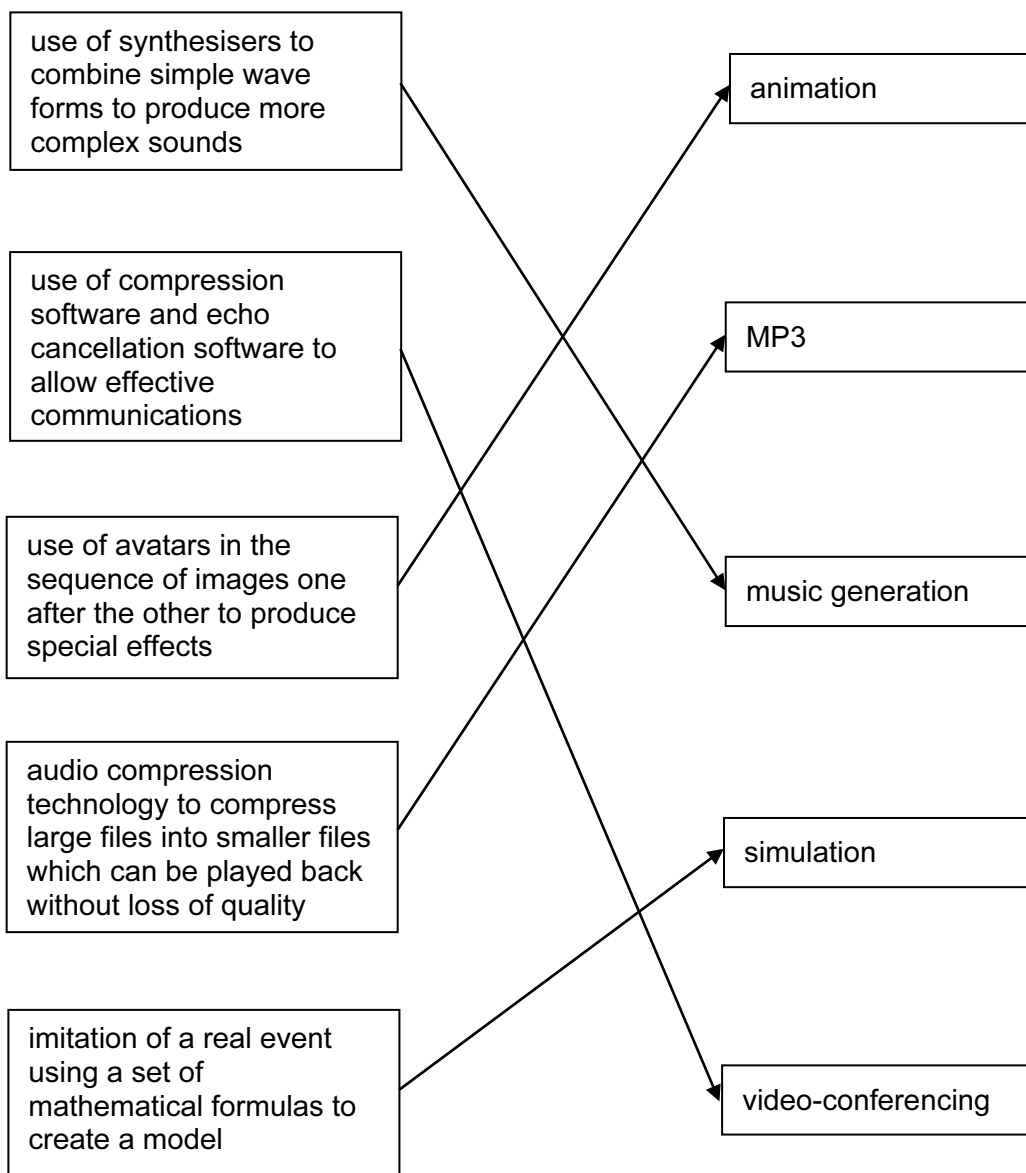
[4]

2 Any **three** benefits from:

- several programmers can work on same software package
- it is **easier** to debug modules than a whole program
- it is **easier** to test modules than test the whole program
- can use modules from a bank of routines (saving time and money)
- enable large tasks to be broken down into more manageable smaller tasks

[3]

3 1 mark per correct arrow connecting left with right



[5]

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

- use of video-conferencing/webcams
- use of emails (and attachments)
- use of VoIP systems
- instant messaging
- chat rooms
- social networking sites
- bulletin boards
- blogs
- (on-line) gaming with others

[4]

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- (b) Any **two** from:
- easier access to inappropriate material
 - poor internet connection can cause delays/lag/drop outs
 - more open to people who may wish to harm you
 - security issues/viruses
 - too much time spent on the computer/health and safety issues
- [2]

- (c) Any **four** from (for example):
- GPS
 - MP3/music files
 - game playing
 - camera/video
 - calendar function
 - calculator/utility functions
 - Bluetooth
 - SMS/MMS/text messaging
- [4]

- 5 (a) – format check
- length check
- [2]

- | | | |
|--|---|-----|
| <p>(b) name:</p> <ul style="list-style-type: none"> - range check - character/type check - check digit - existency check - cross field check | <p>reason:</p> <ul style="list-style-type: none"> - mixture of letters & digits - mixture of letters & digits - it contains letters - does not check format/length - only 1 field present | [2] |
|--|---|-----|

6 1 mark per correct stage

Description of stage	Order of stage
The message travels over the Internet and arrives at recipient's ISP mail server	5
Message sent to sender's ISP mail server	2
Recipient logs on to read his messages	7
<i>The sender composes his message and activates the send command</i>	1
Message held in recipient's electronic mail box	6
ISP mail server examines address associated with message	3
Message retrieved and sent to recipient's computer to be opened and read	8
Sender's ISP mail server decides how to route the message	4

[7]

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- 7 (a) use of chip and PIN technology
- introduction of EMV (international standard for smart card payments)
 - tighter checks on usage (automated phone checks/card readers/the use of 'verification' concept)

(b) 1 mark for name and 1 mark for corresponding description

- phishing: – fraudster sends out email
– user thinks email is legitimate
– clicks on link and is taken to bogus website

- pharming:
– malicious code installed on user's computer or server
– code mis-directs user to fraudulent website without their knowledge

- keylogging/spyware:
– program installed on a computer to monitor all key presses and sends data back to writer of spyware

- or spyware:
– scan files on hard drive
– 'snoop' applications

- hacking: – unauthorised access to computer system
– often to do malicious harm (e.g delete files)

- shoulder surfing:
– the act of watching a person key in secure data (e.g. PIN, password, etc)
– stealing security data by using binoculars, CCTV near ATMs etc. to watch key presses etc.

- war driving
– locating a wireless network by touring around an area
– requires a laptop [6]

- 8 (a) Any **two** from:
– can't pick up semantics (e.g. incorrect use of the words weather/whether)
– could be set to wrong version (e.g. US/UK/other English etc.) [2]

- (b) Any **one** from:
- simple translators do literal translations/use incorrect syntax
- can't pick up the nuances/colloquial words in a language
- problems with grammar
- no equivalent words in other language [1]

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- (c) Any **two** from:
 e.g.
 - change font size/type
 - change font colour/type
 - use of columns
 - search and replace words

[2]

9

C	H	T1	T2	T3	number	OUTPUT
1	0	0	0	0	1500	
2	1500			1	1000	
3				2	100	
4			1		10	
5		1			999	
6			2		99	
7		2			2000	
8	2000			3	5	
9		3			-3	
10		4			0	
11		5				
						5, 2, 3, 2000

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

[6]

10 1 mark for device + 1 mark for reason

backing memory device:

- | | |
|------------------------------|--|
| - memory stick/flash memory | - portable, very small device/large memory |
| - CD/DVD-RW drive | - common media/large memory/portable |
| - (external) hard disk drive | - very large memory/portable |
| - solid state memory | - no moving parts/lightweight/portable |
| - floppy disc drive | - portable |

printer type:

- | | |
|----------------------|---|
| - dot matrix printer | - can operate on dirty/damp atmospheres |
| - 3D printer | - can produce working prototypes |
| - laser printer | - high quality, fast output for multiple copies |
| - inkjet printer | - high quality, low volume output |
| - (graph) plotter | - producing very large, accurate drawings |

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input device (for e.g.):

- | | | |
|--|---|-----|
| <ul style="list-style-type: none"> - keyboard - light pen - mouse/trackerball - touch screen - joystick - specialist CAD devices - microphone - webcam | <ul style="list-style-type: none"> - for keying in data into W/P, S/sheet, etc. - used with CAD packages - pointing device for selecting options - easy to use, suitable when limiting options - <u>easier</u> to control pointer - specific to engineering company - easier for disabled people to enter data - video conferencing | [6] |
|--|---|-----|

11 (a) 15 records [1]

(b) FR, QE, NO, TI, MA
(-1 mark for each error or omission) [2]

(c) (Gross Tonnage > 80 000) OR (Country of Registration = "UK")
 <----- 1mark -----> <----- 1 mark ----->
 or
 (Country of Registration = "UK") OR (Gross Tonnage > 80 000)
 <----- 1mark -----> <----- 1 mark -----> [2]

12 (a) (i) (=) $(A3 * A3 + B3 * B3) - (C3 * C3)$ OR
 (=) $(A3 ^ 2 + B3 ^ 2) - (C3 ^ 2)$ [1]

(ii) = IF (D3 = 0, "Yes", "No")
Quotes essential [1]

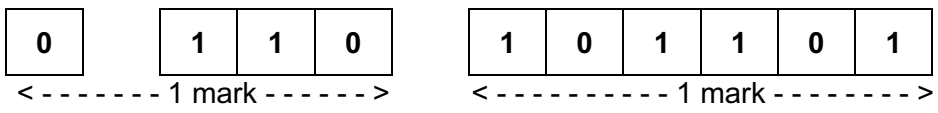
(iii) Any **two** from:
 - draw graphs (e.g. line graph)
 - make use of graph to find c
 - insert formula to calculate c values/ $\sqrt{(a^2 + b^2)}$ gives c values
 - add another column [2]

(b) Any **three** from (for e.g.):
 - can draw graphs (e.g. line graph)
 - cell merging
 - cell formatting (e.g. date, numerical, text, string, etc.)
 - cell locking
 - cut/copy/paste/replicate formulae
 - automatic recalculation
 - goal seek [3]

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- 13 (a)- lift 7
 - presently on 56th floor
 - going down

(b)



[2]

- (c) (i) Any **two** from:
- is lift in service?
 - is a lift already on the 14th floor?
 - is the ultimate destination of a lift in motion the 14th floor?
 - which lift is nearest 14th floor?
 - which lifts are going up?
 - which floor is the lift on?
 - which lifts are below 14th floor?

[2]

(ii) D

[1]

- (d) Any **pair** of points from:
- lift is on floor 000 } 1 mark
 - going down } 1 mark

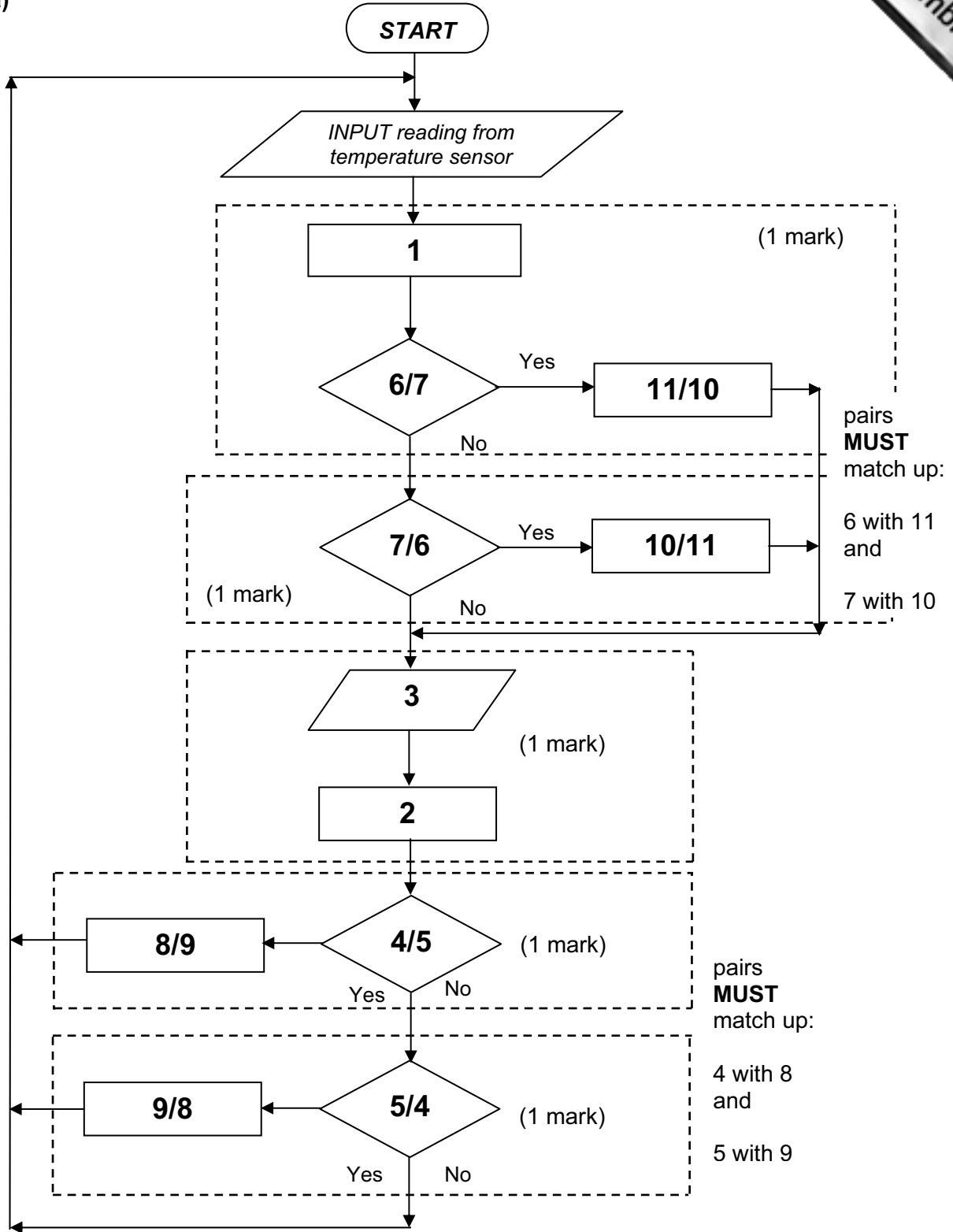
 - lift is on floor 60 } 1 mark
 - going up } 1 mark

 - floor number > 60 } 1 mark
 - going up/down } 1 mark

 - lift out of commission } 1 mark
 - going up/down } 1 mark

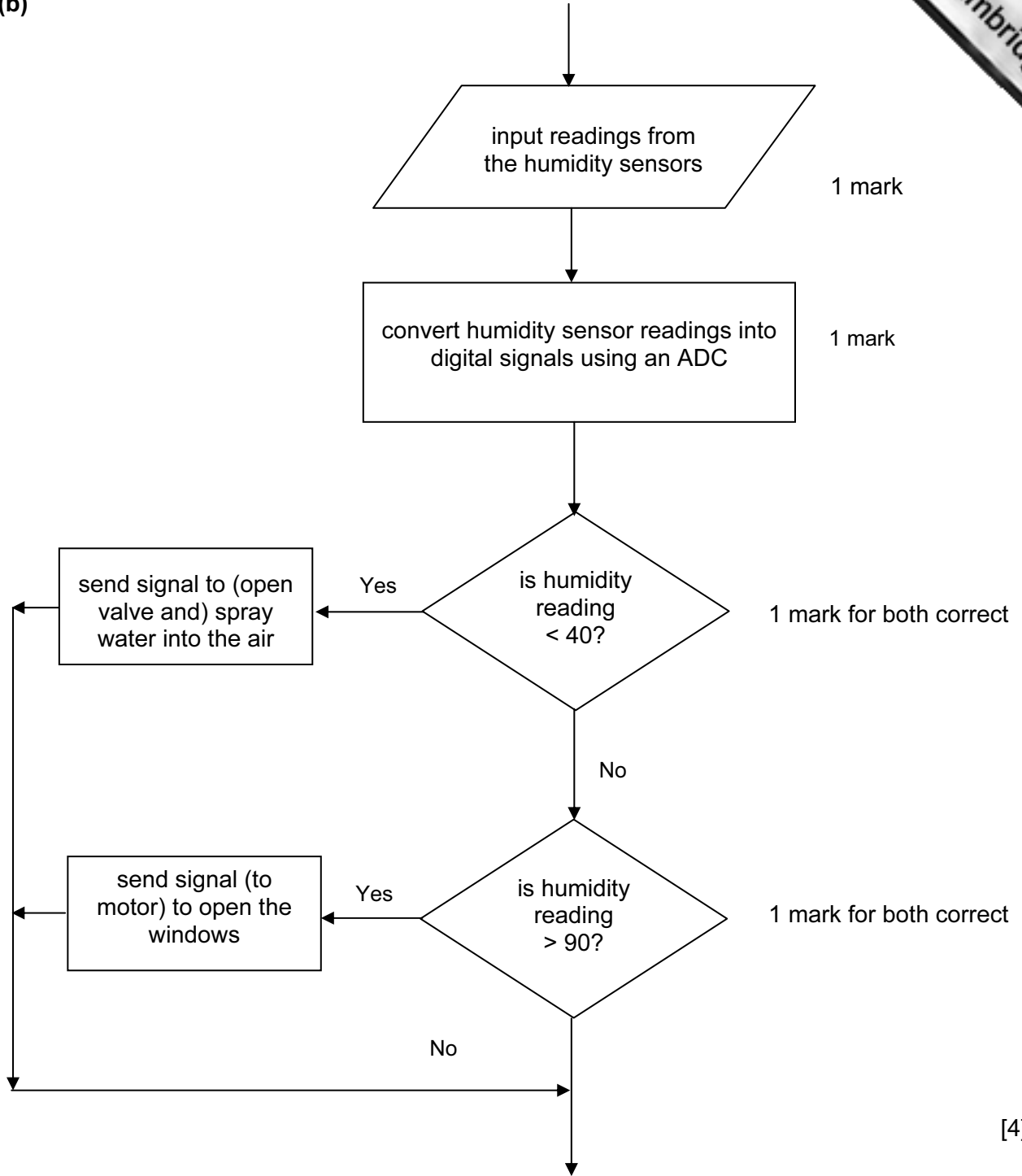
[2]

14 (a)



[5]

(b)



15 (a)

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

1 mark
1 mark
1 mark
1 mark
1 mark

[4]

(b) 1 mark for gate name + 1 mark for each pair of outputs in truth table.

NAND gate		
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

NOR gate		
A	B	X
0	0	1
0	1	0
1	0	0
1	1	0

[3]

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16 sample program:

```
x = 0: tbun = 0: tcoffee = 0: tcake = 0: tsand = 0: tdessert = 0
repeat
  input item
  if item = "bun" then tbun = tbun + 0.5
  else if item = "coffee" then tcoffee = tcoffee + 1.20
  else if item = "cake" then tcake = tcake + 1.50
  else if item = "sandwich" then tsand = tsand + 2.10
  else if item = "dessert" then tdessert = tdessert + 4.00
  else print "error"
until item = "end"
if tbun > x then x = tbun
if tcoffee > x then x = tcoffee
if tcake > x then x = tcake
if tsand > x then x = tsand
if tdessert > x then x = tdessert
total = tbun + tcoffee + tcake + tsand + tdessert
print total, x
```

marking points:

- complete initialization
- correct loop structure (could be while – end while or do – until loop.)
- input item INSIDE the loop
- check on which item has been input
- *summation of value of each item input
- check if each item total is the largest value
- variable (e.g. x) takes on the highest total value
- total value of ALL five totals
- correct output OUTSIDE the loop

[6]