MARK SCHEME for the May/June 2014 series

0420 COMPUTER STUDIES

0420/13   Paper 1, maximum raw mark 100

1 (a) 1 mark for correct name + 1 mark for correct <u>corresponding</u> diagram.

ring

star

bus
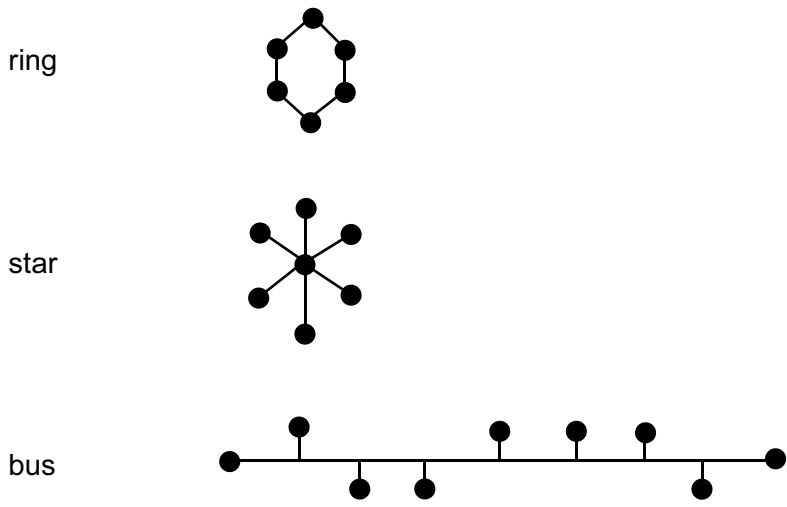
[4]

(b) Any **two** from:
   – shared resources
   – better/easier communications
   – easier to "keep track" of users from a central point
   – all computers/users can share same data/programs (stored on a central database)/easier transfer of data between computers
   – can access your files from any computer on the network   [2]

(c) Any **one** from:
   – <u>greater</u> risk of <u>spreading</u> viruses to other computers/the network
   – <u>increased</u> security risks when computers connected together
   – failure of server affects all stations   [1]

2   (a)   (i)   Any **one** from:
–   airline bookings need to be done in real time <u>to stop double bookings</u>
–   batch processing only done at the end of the day/week so <u>double booking is possible</u>
[1]

       (ii)   Any **one** from:
–   GUI uses pointing devices/icons/windows (mouse, trackerball, ……)
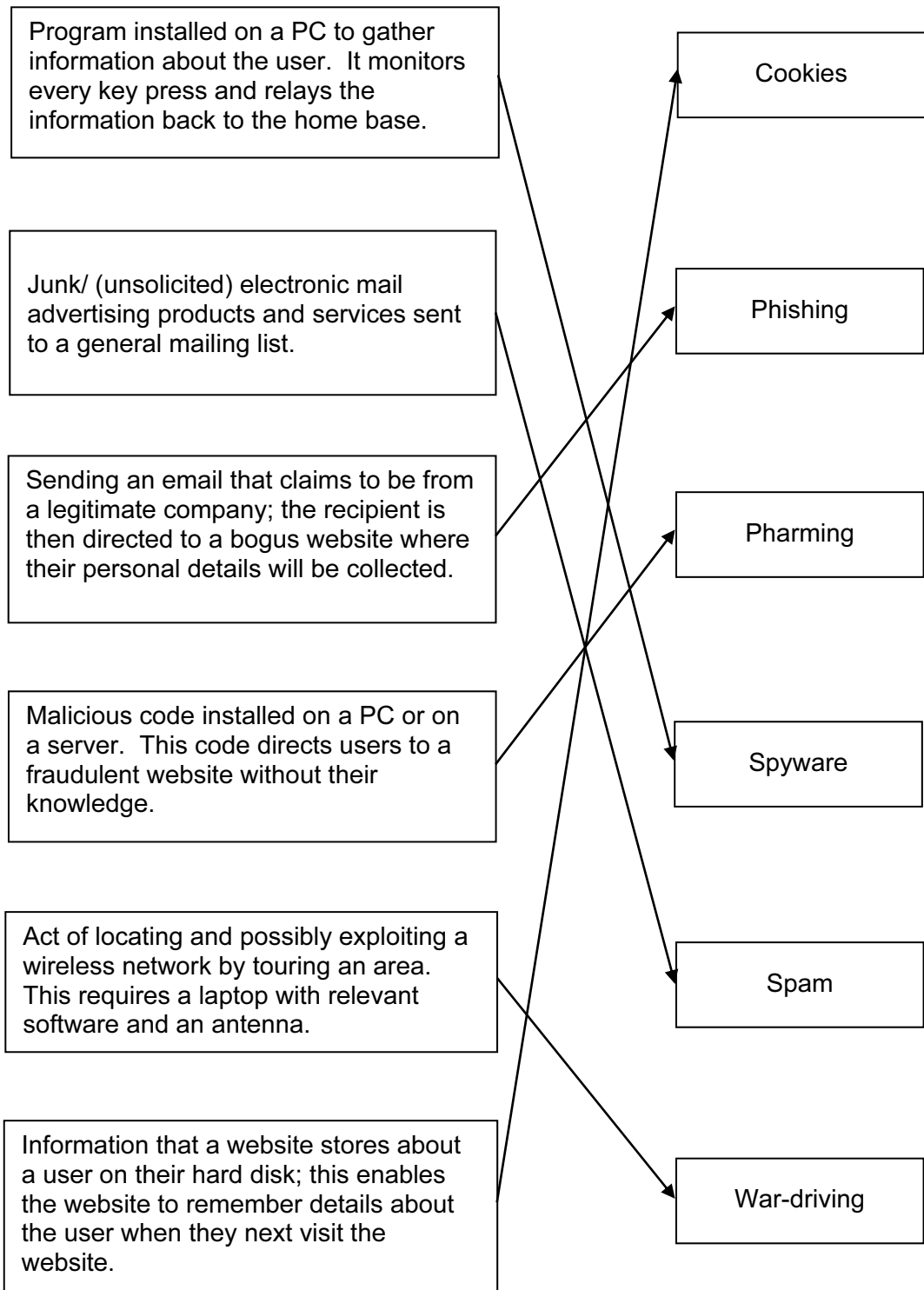–   keyboard used with command line interfaces   [1]

     (b)   Any **four** functions from:
–   file management/delete/copy/save/store/load files
–   controls/manages software/hardware
–   memory management
–   I/O control
–   error messages/handling
–   security issues
–   logging on/off
–   accounting/user account management
–   time slicing
–   multi access
–   multi tasking/task management
–   JCL/job control/batch processing
–   network management   [4]

3   1 mark for naming validation check + 1 mark for correct <u>matching example</u>

field name	name of validation check	example of data which would fail validation check
date of visit	format check	e.g. 2012/12/04 e.g. 3rd March 2012
patient's height	type/character check range check limit check	can't be < 0 or > 2.5m e.g. –5, five e.g. 8, -3,
patient ID	type check length check range check	(can't be < 0 or > 99999999) e.g. 3142ABCD e.g. 2131451, 136498207 e.g. –3, 851341625
contact telephone number	length check type/character check format check	e.g. 0773141621834 e.g. 7H215GD e.g. 01223/123456/8901234

[8]

4 1 mark for each correct arrow up to the maximum of 5 marks.

Program installed on a PC to gather information about the user. It monitors every key press and relays the information back to the home base.	Cookies
Junk/ (unsolicited) electronic mail advertising products and services sent to a general mailing list.	Phishing
Sending an email that claims to be from a legitimate company; the recipient is then directed to a bogus website where their personal details will be collected.	Pharming
Malicious code installed on a PC or on a server. This code directs users to a fraudulent website without their knowledge.	Spyware
Act of locating and possibly exploiting a wireless network by touring an area. This requires a laptop with relevant software and an antenna.	Spam
Information that a website stores about a user on their hard disk; this enables the website to remember details about the user when they next visit the website.	War-driving

[5]

5   *pendown*

   left 45

   - - - - - - - - - - -
   forward 28
   right 45   (1 mark)
   - - - - - - - - - - -
   forward 20
   right 135   (1 mark)
   - - - - - - - - - - -
   forward 28
   left 90   (1 mark)
   - - - - - - - - - - -
   forward 28
   right 135   (1 mark)
   - - - - - - - - - - -
   forward 20
   right 45   (1 mark)
   forward 28
   - - - - - - - - - - -
   (penup)
   (left 45)

                                                                          [5]

6   **(a)** Any **two** from:
   –   any reference to cost saving plus reason
   –   any reference to time saving plus reason
   –   possible to order 24/7
   –   goods delivered to customer's house (may be heavy/large goods)
   –   customers who don't live in Europe can buy goods   [2]

   (b) Any **two** from:
   –   use of cookies (to find customer preferences)
   –   open 24/7
   –   wider customer base (potentially)   [2]

   (c) Any **three** from:
   –   possible redundancies
   –   need to re-train/learn new skills/job role within company can change
   –   possibility of working from home
   –   relocation of certain staff (to a different warehouse)
   –   **<u>increased</u>** health risk to staff due to more computer-based work   [3]
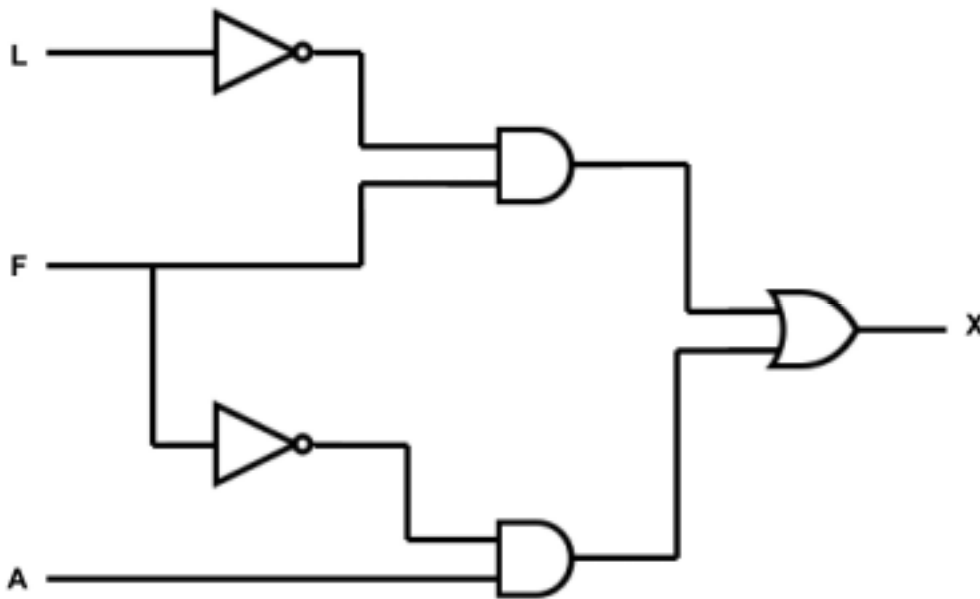
(d) Any **two** from:
- – <u>secure</u> payment method
- – shopping basket
- – checkout
- – search facility
- – "remember customer"/log in
- – customers who bought "X" also bought "Y" facility
- – hyperlinks to other pages/websites
- – currency converter
- – create customer account
- – description of the products for sale
- – contact details   [2]

7 (a) 1 mark per correct logic gate (accept other gate symbols)

[5]

(b)

L	F	A	X	
0	0	0	0	
0	0	1	1	1 mark
0	1	0	1	
0	1	1	1	1 mark
1	0	0	0	
1	0	1	1	1 mark
1	1	0	0	
1	1	1	0	1 mark

[4]

8 1 mark per correct column.

number	product	value	OUTPUT
5	1	5	
(5)	5	4	
(5)	20	3	
(5)	60	2	
(5)	120	1	
(5)	(120)	0	
			5, 120

[4]

9 (a) 1 mark for correct formula in cell D2, 1 mark for correct formula replication D2 to D7, 1mark for correct formula in G2 and 1 mark for correct formula replication from G2 to G7 (allow follow through in both columns D and G).

	D	G
1	**Volume change (litres)**	**Pressure change (bar)**
2	= C2 – B2	= F2 – E2
3	= C3 – B3	= F3 – E3
4	= C4 – B4	= F4 – E4
5	= C5 – B5	= F5 – E5
6	= C6 – B6	= F6 – E6
7	= C7 – B7	= F7 – E7

Accept formulas such as:

SUM(C2 – B2)

(or any example that actually works)

[4]

(b) B1/2 to B7   } 1 mark
C1/2 to C7   }

G1/2 to G7   } 1 mark

[2]

(c) = SUM(D2:D7)/6   or
= AVERAGE(D2:D7)   or
= AVERAGE(D2,D3,D4,D5,D6,D7)   or
= (D2 + D3 + D4 + D5 + D6 + D7)/6   [1]

(d) = MAX(G2:G7)   or
= MAX(G2,G3,G4,G5,G6,G7)   [1]

10 1 mark for each benefit and 1 mark for each drawback (maximum of 2 marks for each communication method).

mobile phones
benefit:
– wireless system (so can be used anywhere)
– small, portable device/always with you
– instantaneous (e.g. take photo and immediately transfer file)
– can leave messages if recipient not available

drawback:
– contracts tend to be expensive
– phone calls overseas are very expensive
– out of signal
– battery life poor
– data transfer rate can be slow
– not very large memories
– small screens/keyboards make it more difficult to type/navigate

video conferencing
benefit:
– many people can take part in conference across the world
– can see all delegates on screen (and also talk in synchronised way)
– relatively inexpensive since uses Internet for communications
– can hold meeting of several people at short notice
– no need to pay for travelling/hotels/meeting rooms
– less time wasted travelling to meetings overseas/staff not out of office
– safer – recent increased risk of terrorist attacks

drawback:
– equipment is expensive to buy initially
– quality of sound/picture can be poor (poor reception)
– problems with time zones
– fast internet connection required

emails:
benefit:
– can send at any time/recipient can open any time
– inexpensive (same cost worldwide)
– can send large multimedia files
– no need for expensive equipment
– can send to multiple recipients
– can use attachment facility

drawback:
– if recipient doesn't have correct software, can't open attachments
– possibility of virus infections/phishing from attachments
– need Internet connection/ISP
– may not get immediate response (ONLY IF REVERSE NOT GIVEN UNDER BENEFIT)　　[6]

11 **(a)** Any **two** from:
– "always on" (no need to dial up each time)
– allows telephones to be used at same time as computer in use
– much faster data transfer rate
– dial up charges per minute of use　　[2]

(b) (i) 1 megabits/second = 0.125 Mbyte/second
20 Mbyte file takes 20/0.125 seconds
i.e. **160 seconds**

(if final answer is incorrect, allow 1 mark for calculation)　　[2]

(ii) 8 megabits/second = 1 Mbyte/second
20 Mbyte file takes 20/1 seconds
i.e. **20 seconds**

allow b(i) divided by 8 as follow through　　[1]

(c) 1 mark for each advantage and 1 mark for each disadvantage
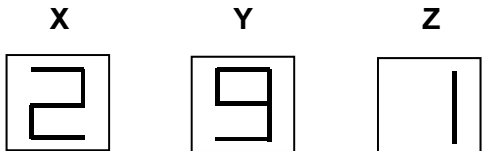**advantages:**
– no <u>trailing</u> wires
– can use equipment anywhere (if in range)
– reduced costs since less cabling required
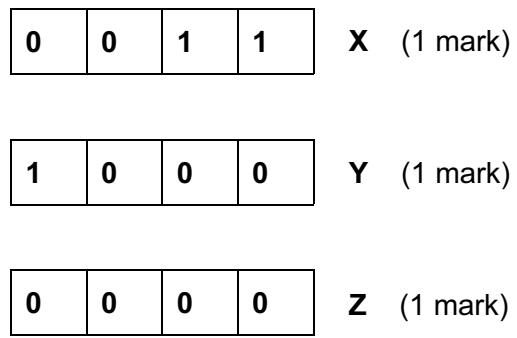
disadvantages:
– limited range
– can be blocked by walls/other obstacles
– <u>increased</u> security risk if not password protected
– slower data transfer rate　　[2]

12 (a)   X   Y   Z

[3]

(b)

0	0	1	1

X   (1 mark)

1	0	0	0

Y   (1 mark)

0	0	0	0

Z   (1 mark)

[3]

(c) (i) E, E, E
Flashing display/digits
ERR

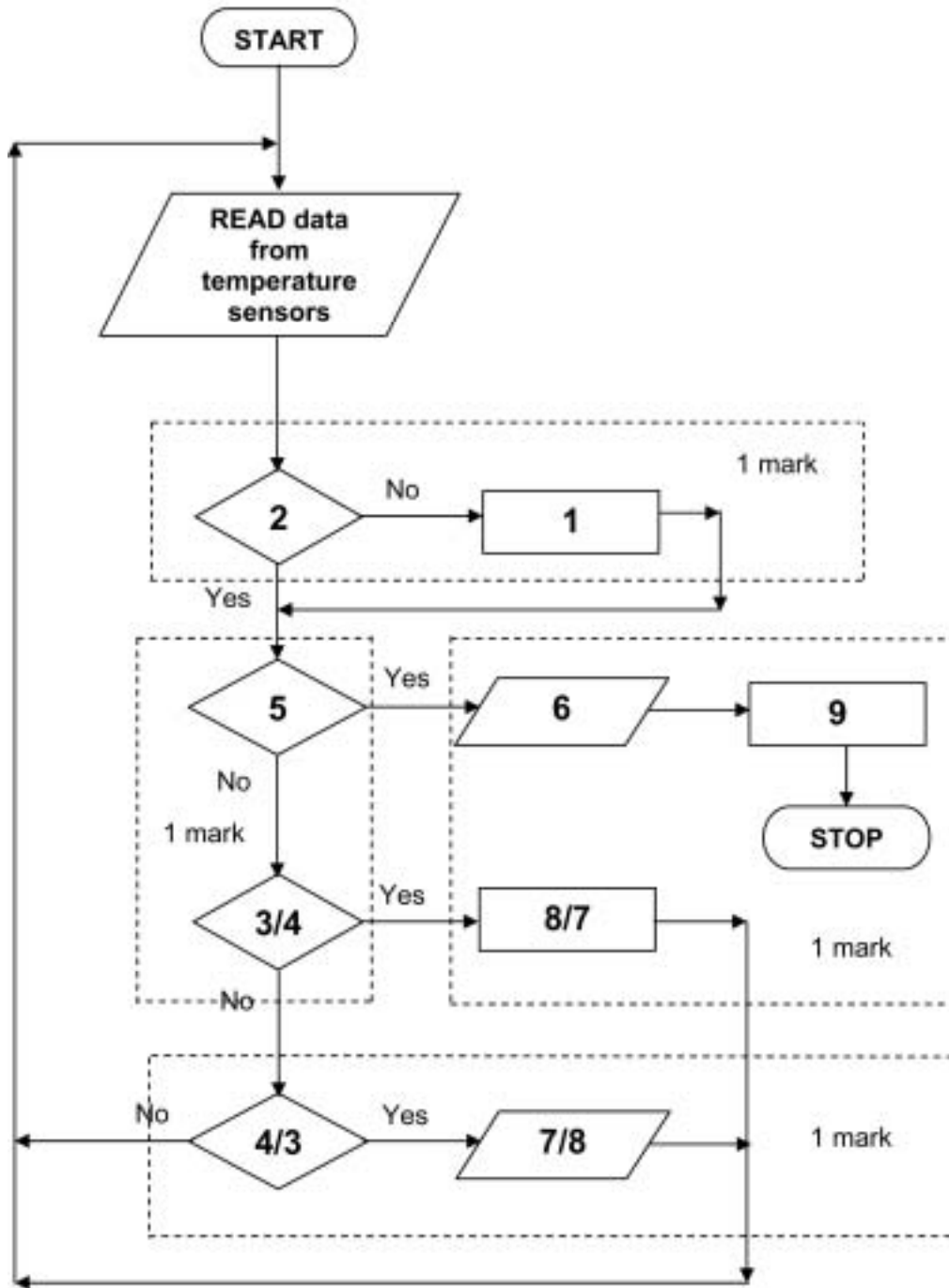(or the equivalent answer)   [1]

(ii) Any **one** from:
– a fault in the system
– reading exceeded the value 999   [1]

13

(3 and 8 AND 4 and 7 MUST be marked in PAIRS)
(accept the phrases)   [4]

14 (a) (i) 9 [1]

(ii) 7 [1]

(b) OR, CO, NJ, AK, NV
(−1 mark for each error: i.e. each omission, each incorrect additional item) [2]

(c) (**Area(sq miles)** > 100 000)   **AND**   (**Travel time to work (min)** < 25)

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

Or

(**Travel time to work (min)** < 25)   **AND**   (**Area(sq miles)** > 100 000)

< - - - - - - - - - 1 mark - - - - - - - - > < - - - - - - - - - 1 mark - - - - - - - - - - >
[2]

(i) Ref or Name of State [1]

(ii) this is unique to for each state [1]

15 possible marking points:
(award marks for each point up to the maximum of 6)

- initialisation
- inputs in the right place
- correct loop (while or repeat)
- adding up sound levels
- finding highest/loudest sound level
- counting number of sound levels which have been input
- finding the average value
- correct outputs (OUTSIDE loop and needs some previous processing)

sample program:

```
total = 0: highest = 0: count = 0            (1 mark)

input sound                                  (1 mark)

while sound > 0 do                           (1 mark)
    total = total + sound                    (1 mark)
    if sound > highest then highest = sound  (1 mark)
    count = count + 1                        (1 mark)
    input sound

endwhile

average = total/count                        (1 mark)

print average, highest                       (1 mark)
```
[6]