CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2013 series

7010 COMPUTER STUDIES

7010/12   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.

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1   (a) Any **two** items from the list:
        purpose of the system/program/software/package
        program listing/coding
        programming language used
        flowcharts/algorithms/pseudocode
        screen (input) formats/layouts
        hardware requirements
        software requirements
        (minimum) memory requirements
        known bugs
        list of variables (and their meaning)/data dictionary
        file structures
        sample runs
        output formats/layouts
        validation rules
        meaning of error messages
        installation guide   [2]

    (b) Any **two** items from the list:
        purpose of the system/program/software/package
        how to log in/log out
        how to load/run software
        how to save/load files
        how to do a search
        how to sort data
        how to print (out documents/files)
        how to delete/add/amend records
        screen (input) formats/layouts
        output formats/layouts
        hardware requirements
        software requirements
        sample runs
        meaning of error messages
        troubleshooting/help/FAQs
        tutorials
        installation guide   [2]

2   1 mark for each correctly identified use of data storage medium (**column**):

	CD-ROM	DVD-RAM	fixed hard disk	memory stick
storage medium where data can only be read and not altered	✓			
portable medium which allows transfer of data between computers				✓
memory where operating systems and applications software are usually stored			✓	
medium which allows recording and playback to occur at the same time		✓		

[4]

3 (a) 1 mark for type of memory used and 1 mark for data transfer method.

chosen device	type of internal memory	method of transferring data
MP3 player	– (NAND) flash memory – solid state memory – type of EEPROM – non-volatile memory – SD card	– using USB (port/cable) in computer – blue tooth/WiFi connection – slot card into computer card reader
digital camera	– (NAND) flash memory – solid state memory – type of EEPROM – non-volatile memory – SD card or XD card	– using USB (port/cable) in computer – blue tooth/WiFi connection – slot card into computer card reader
mobile phone	– (NAND) flash memory – solid state memory – type of EEPROM – non-volatile memory – SD card	– using USB (port/cable) in computer – blue tooth/WiFi connection – slot card into computer card reader

[2]

(b) (i) Any **one** disadvantage from:
 – memory size in mobile phone is usually much smaller
 – many MP3 features (e.g. shuffle) not available on the mobile phone
 – track/song can be interrupted by an incoming call on a mobile phone   [1]

(ii) Any **one** disadvantage from:
 – poorer quality of image due to phone's inferior camera lens/fewer pixels /lower resolution
 – stores fewer pictures
 – fewer photographic options   [1]

4 (a) 1 mark for each correct health and safety risk identified:

potential risk	*health* issue	*safety* issue
repetitive strain injury (RSI) caused by excessive clicking of a mouse or typing	✓	
trailing wires connected to a computer system		✓
ozone gas and toner particles produced during laser printer operation	✓	
headaches and eye strain caused by glare from a computer monitor/screen	✓	
electrocution risk caused by spilling liquids on a computer system		✓

[5]

(b) Any **three** from:
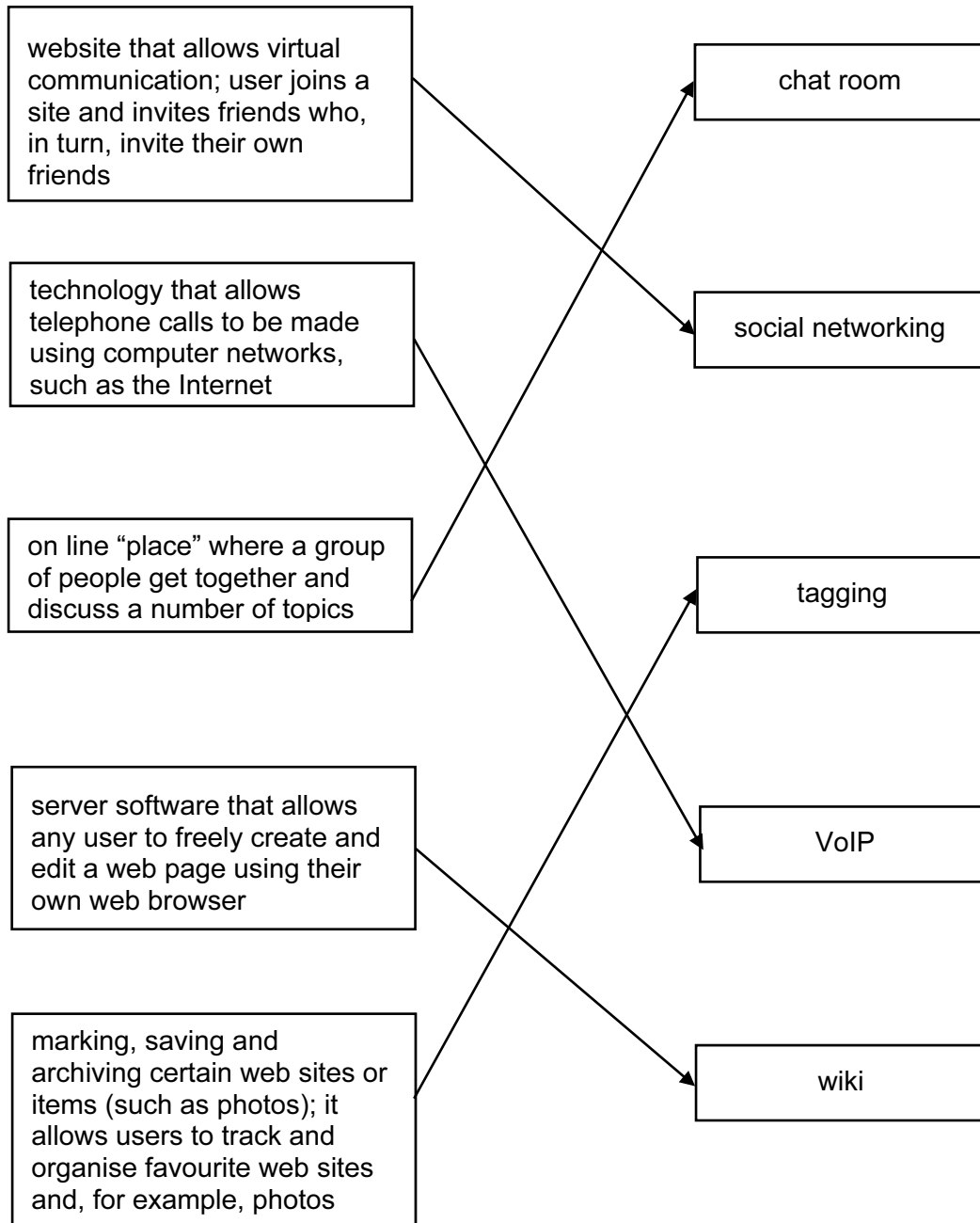–   loss of work/unemployment
–   de-skilling of workers
–   need for workers to re-train
–   can work from home/remote working
–   use of video conferencing rather than face to face meetings
–   quieter environment in the office
–   more use of "out sourcing" of work (workers become project managers)
–   use of computer for non-work related activities *(accept an example of this)*   [3]

5

website that allows virtual communication; user joins a site and invites friends who, in turn, invite their own friends		chat room

technology that allows telephone calls to be made using computer networks, such as the Internet		social networking

on line "place" where a group of people get together and discuss a number of topics		tagging

server software that allows any user to freely create and edit a web page using their own web browser		VoIP

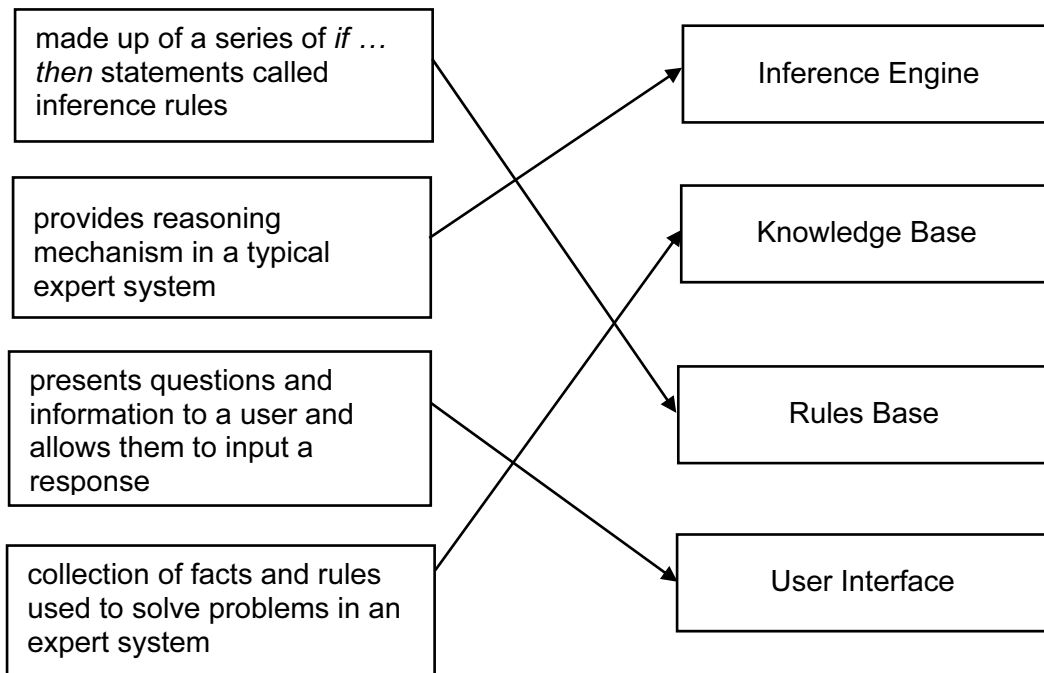| marking, saving and archiving certain web sites or items (such as photos); it allows users to track and organise favourite web sites and, for example, photos		wiki

[4]

6 (a) Any **one** from:
 – not possible to save data on a CD-ROM
 – CD-ROMs are read only
 – data cannot be altered on a CD-ROM   [1]

(b) Any **one** from:
 – WiFi only connects devices together in the home/connects to router
 – still need Internet external connection via telephone network/wires   [1]

(c) Any **one** from:
 – satellites send signals **TO** (the GPS system in) the car (sat nav)
 – GPS device and NOT the satellite works out the cars' location   [1]

(d) Any **one** from:
 – Messages left in the inbox/stored on server
 – and then opens it/reads message at their leisure   [1]

(e) Any **one** from:
 – not true since time zones/differences prevent this
 – meetings can be held *at short notice* (which is very different)   [1]

7 (a) Any **four** points from:
- (light) sensor sends data signals about spinning CD to microprocessor
- the signals/data are converted from analogue to digital (by an ADC)
- microprocessor uses data and "counts" number of CD revolutions per second/calculates speed of revolution
- this calculated/received value is compared to the value stored in memory
- if the number of revolutions/speed is out of acceptable range microprocessor sends a signal …
- … and the CD speed is increased/decreased accordingly
- an error message is also sent if the speed is out of range   [4]

(b) Any **two** points from:
- sensors indicate sudden jolt/movement
- data from CD stored in a temporary memory/buffer
- there is a (2 to 4 second) delay in "real time" playback
- playback is suspended until device is stable again   [2]

(c) Any **one** from:
- no moving parts e.g. no spinning CDs, solid state
- no "physical" media   [1]

8 (a)

made up of a series of *if …* *then* statements called inference rules	→	Inference Engine
provides reasoning mechanism in a typical expert system		Knowledge Base
presents questions and information to a user and allows them to input a response		Rules Base
collection of facts and rules used to solve problems in an expert system		User Interface

[3]

(b) Any **three** from:

– lack human common sense
– cannot make creative responses in unusual/new circumstances
– can't always explain clearly their logic and reasoning
– lack a degree of flexibility
– not able to recognize when no answer is actually available
– do not learn unless the knowledge base/expert system is updated
– only give percentage probability that answer could be correct   [3]

9   (a) Any **two** from:
–   can put the film anywhere (e.g. stick on a curved wall)
–   can fit to awkward shapes where rigid screen would be impossible
–   can be any size required
–   self-contained unit
–   use less energy
–   less physical space required   [2]

(b) Any **two** from:
–   advertising (e.g. in railway stations, airports, etc.)
–   books/magazines/newspapers made out of the thin film
–   art (i.e. moving pictures, light shows, etc.)
–   any screen application e.g. TV, mobile phone etc.   [2]

10 (a) Any **one** from:
–   allows digital systems to use analogue phone networks
–   convert analogue – digital – analogue
–   digital signal converted from one form to another (for transmission)   [1]

(b) Any **two** from:
–   <u>blocks</u> unauthorized external users gainin**g** <u>access to the intranet</u>
–   blocks programs/software gaining access to Internet from intranet
–   filters out certain websites to users of intranet when accessing the Internet
–   **<u>aids/helps</u>** to prevent viruses
–   packet inspection/traffic flow monitoring   [2]

(c) Any **two** from:
–   hacking
–   viruses/malware
–   security issues (pharming, phishing, spyware, etc.)
–   access to undesirable web sites
–   abuse of computer time by work force   [2]

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11 (a) (i) 5 [1]

     (ii) 8 [1]

(b) M3 and M8 only [1]

(c) (**Cars per day** > 50 000) OR (**Toll charge per km ($)** > 0.50)

    < - - - - - (1 mark) - - - - >   < - - - - - - - - - (1 mark) - - - - - - - - ->

    Or

    (**Toll charge per km ($)** > 0.50) OR (**Cars per day** > 50 000)

    < - - - - - - - (1 mark) - - - - - - - >   < - - - - - - - (1 mark) - - - - - - ->

[2]

12 (a) a

A	B	C	D	E	K	X
3	5	1	4	8	0	0
5	3				3	1
		4	1		1	1
			8	1	1	1
						0
	4	3			3	1
		8	3		3	1
						0
	8	4			4	1
						0
8	5				5	1
						0

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

[5]

(b) 8, 5, 4, 3, 1   [1]

(c) SORT/ORDER (descending) routine   [1]

(d) – would continue looping round even when sorting complete
     – loop would never end/infinite loop   [1]

13 (a) (i) name: – character/type check
                                      – presence check

              address: – character/type check
                                      – presence check
                                      – use lookup file/database

              type of card: – character/type check
                                      – presence check
                                      – consistency check
                                      – format check

              card number: – length check
                                      – format check
                                      – check digit
                                      – range check
                                      – character/type check
                                      – presence check

              (need <u>different</u> validation check for each item)   **[4]**

       (ii) – type of credit/debit card
                – limited number of possible options   **[2]**

   (b) date of birth   –   drop down boxes of day, month and year
                                     –   use of input boxes:

                                        ☐☐   ☐☐   ☐☐☐☐

                                     –   calendar object

           male or female   –   radio buttons
                                     –   tick/check boxes
                                     –   drop down/combo box

           accept/decline company conditions
                                     –   tick/check boxes
                                     –   radio buttons
                                     –   drop down/combo box   **[3]**

14 **(a)** sequence of colours is: blue
                                             green
                                             white

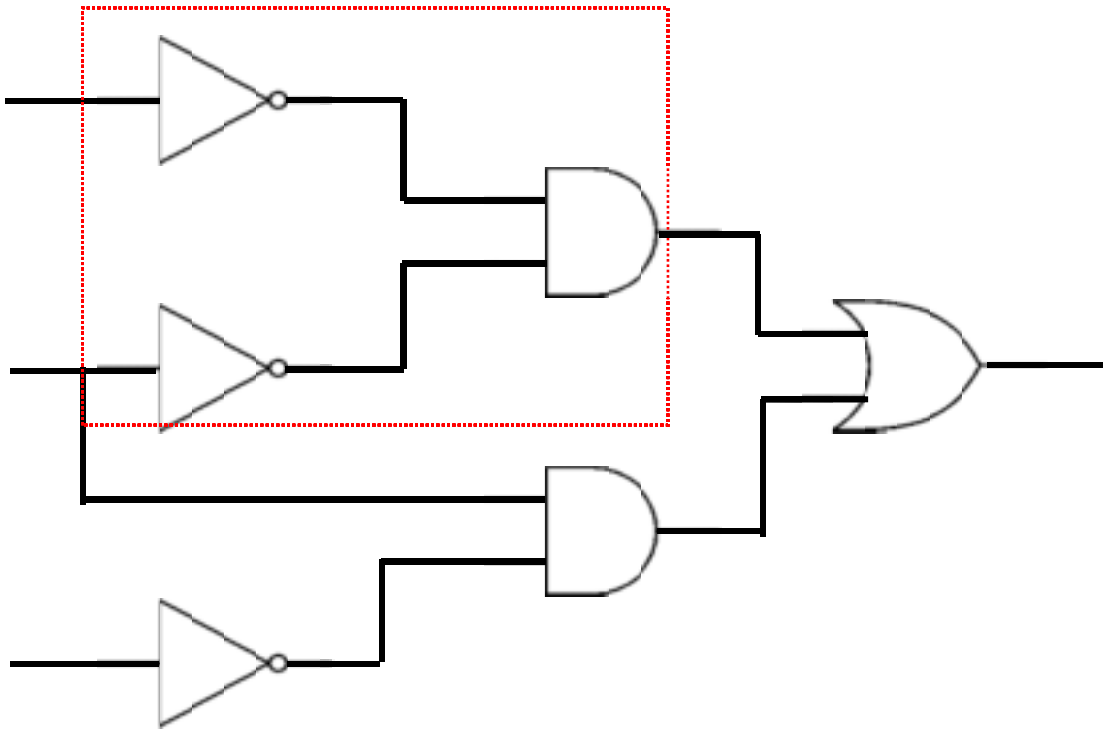time delay is: 7 seconds   [2]

(b)

| 1 | 0 | 1 | 0 | 0 | 1 | | 1 | 0 | 1 |

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

[2]

(c) – sequence always starts from left to right
    – so sequence would still be red, blue then green   [2]

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15 (a)

1 mark per correct logic gate

(Accept other notation for logic gates)   [6]

(b)

B	S	P	X	
0	0	0	1	}
0	0	1	1	
0	1	0	1	}
0	1	1	0	
1	0	0	0	}
1	0	1	0	
1	1	0	1	}
1	1	1	0	

[4]

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[5]
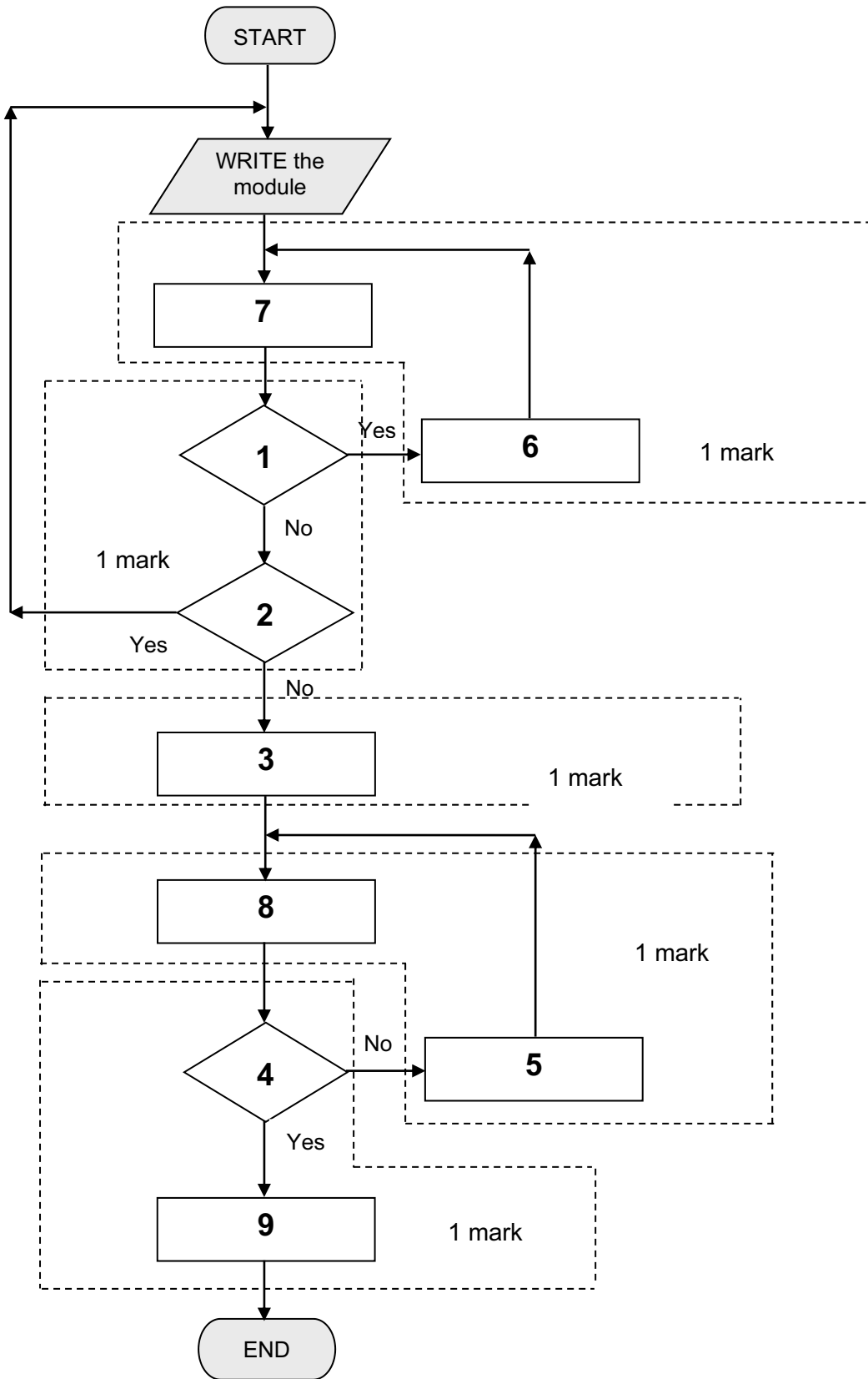
17 marking points:

–   initialisation of all the variables   1 mark
–   corrects loop (1 to 50 000)   1 mark
–   input number (INSIDE a loop)   1 mark
–   how to identify the first 3 digits in the input number   1 mark
–   test which of the 4 networks number comes from   1 mark
–   increment appropriate network total (INSIDE a loop)   1 mark
–   addition of some form of error checking   1 mark
–   output totals (OUTSIDE the loop)   1 mark

sample coding:

```
Y = 0: N = 0: K = 0: S = 0                                                        1 mark

for count = 1 to 50 000                                                           1 mark

      input number                                                                1 mark

      X = number/100 000 000                                                      1 mark

      if X > 0.7 then S = S + 1                        }
            else if X > 0.6 then K = K + 1             }                          2
                  else if X > 0.5 then N = N + 1       }                          marks
                        else if X > 0.4 then Y = Y + 1 }
                              else print "error in number"                        1 mark
next count

print Y, N, K, S                                                                  1 mark
```

[6]