# N5

**National Qualifications**
**SPECIMEN ONLY**

Mark

**SQ08/N5/01**

**Computing Science**

Date — Not applicable

Duration — 1 hour and 30 mins

*SQ08N501*

**Fill in these boxes and read what is printed below.**

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

| Day | Month | Year |
|-----|-------|------|
| D D | M M | Y Y |

Scottish candidate number

**Total marks — 90**

**SECTION 1 — 20 marks**

Attempt ALL questions in this section.

**SECTION 2 — 60 marks**

Attempt ALL questions in this section.

Read all questions carefully before attempting.

Write your answers in the spaces provided, using **blue** or **black** ink.

Show all workings.

Before leaving the examination room you must give this booklet to the Invigilator.
If you do not, you may lose all the marks for this paper.

SQA

**SECTION 1 — 20 marks**

**Attempt ALL questions**

1. Convert the value 25 into an 8-bit *binary* number.  Show your working.

**1**

2. Explain why the telephone number 07700 901012 should be stored as a *text field type* and not a *numeric field type*.

**1**

_____

_____

3. Name the *bus* used to transfer instructions from the main memory to the processor.

**1**

_____

4. Companies must adhere to *health and safety legislation* for employees using computer systems regularly.

Adjustable workstation chairs allow computer users to change the height and seating position to prevent back ache.

Name **one** other workstation feature and describe how it reduces a risk to health.

**1**

_____

_____

5. Describe the purpose of *JavaScript scripting language*.

**2**

_____

_____

**6.** Here is part of a database used to store information about cameras.

| Brand | Model | Megapixels (mp) | Screen Size | Optical Zoom | Colour | Continuous Shooting (Fps) | Wide Angle | Price (£) |
|---|---|---|---|---|---|---|---|---|
| Yarxa | YX2300 | 16·6 | 3 | 21 | Silver | 14 | 21 | £131.70 |
| JK | JK1209 | 16 | 3 | 15 | White | 1·39 | | £95.99 |
| Katichi | K1456AD | 16 | 2·7 | 21 | Red | | | £99.99 |
| Gifipix | PH900 | 16 | 3 | 26 | Black | | | £139.99 |
| Yarxa | YX3500 | 14·1 | 3 | 21 | Black | 1 | 25 | £129.99 |
| Katichi | K2300WA | 14 | 3 | 18 | Black | 1·2 | 28 | £119.99 |
| Gifipix | PH800 | 14 | 3 | 18 | Black | 1·2 | | £134.99 |
| Katichi | K2800AD | 14 | 2·7 | 26 | Red | | | £139.99 |
| Katichi | K2850AD | 14 | 3 | 26 | White | | | £142.99 |
| Gifipix | PH500 | 14 | 3 | 24 | Black | 1·2 | 24 | £147.99 |

Describe how the data has been sorted. **2**

_____

_____

**7.** The *pseudocode* below shows how a program could store and process the race times (in seconds) of the finalists in a 100 m sprint.

```
Line 1. SET  alltimes  TO  [10.23, 10.1, 10.29, 9.9,
        10.12, 10.34, 9.99, 9.58]
Line 2. SET  fastest_time  TO  alltimes [0]
Line 3. FOREACH  time  FROM  alltimes  DO
Line 4.    IF  time  < fastest_time THEN
Line 5.        SET  fastest_time  TO  time
Line 6. END IF
Line 7. END FOREACH
Line 8. SEND ["The winner's time was: ", fastest_time]
        TO DISPLAY
```

State the most suitable *data structure* and *data type* for storing the highlighted variable (*alltimes*) used above.

**2**

**8.** A *web page* can be found using the *URL*:

*http://www.thooons.co.uk/partymusic/party.html*

Identify the *file type* being accessed.

**1**

**9.** An online auction company has suffered a *Denial of Service attack*.

(a) Describe what is meant by a *Denial of Service attack*.

**1**

(b) Explain the effect it would have on *users*.

**1**

**Total marks 2**

**10.** Describe **one** benefit of using *biometric sensors* for security.

**1**

_____

_____

**11.** Operating system design is developing to take account of smartphones and tablets.  Describe **one** example of this.

**1**

_____

_____

_____

_____

**12.** A college has just upgraded all the computer equipment used by staff.

Describe **one** issue that should be considered when disposing of the old equipment.

**1**

_____

_____

_____

_____

**13.** Describe the role of a *file server* in a *client server* network.

**1**

_____

_____

_____

14. Below is a section of code written in the programming language ALGOL.

```
begin
integer N;
Read Int(N);
begin
real array Data[1:N];
real sum, avg;
integer i;
sum:=0;
for i:=1 step 1 until N do
begin real val;
Read Real(val);
Data[i]:=if val<0 then -val else val
end;
for i:=1 step 1 until N do
sum:=sum   Data[i];
avg:=sum/N;
Print Real(avg)
end
end
```

State **two** techniques that the programmer could use to make this code more readable.

**2**

_____

_____

_____

_____

15. State **where** in a computer system the *binary* instructions are stored before they are executed.

**1**

_____

**SECTION 2 — 70 marks**

**Attempt ALL questions**

16. An app is being developed for tourists to use to find out information about a holiday location such as: activities, how to get around, and the weather.

   When a tourist uses the app a number of options are displayed for their current location.

   Options for Berlin

   map  weather

   transport  tourist info

   (a) Describe **two** advantages of running this app on a smartphone rather than a desktop PC.

   **2**

   _____

   _____

   _____

   _____

   (b) Comment on the suitability of the **user interface** design shown above for use on a smartphone.

   **2**

   _____

   _____

   _____

**Question 16 (continued)**

(c) The temperature is displayed as 23·6 °C

State how this number would be stored by a computer system. **2**

_____

_____

(d) The app will store photographs of the tourist attractions.

(i) State a *standard file format* suitable for storing photographs. **1**

_____

(ii) The resolution of the photographs is reduced to make the file size smaller.

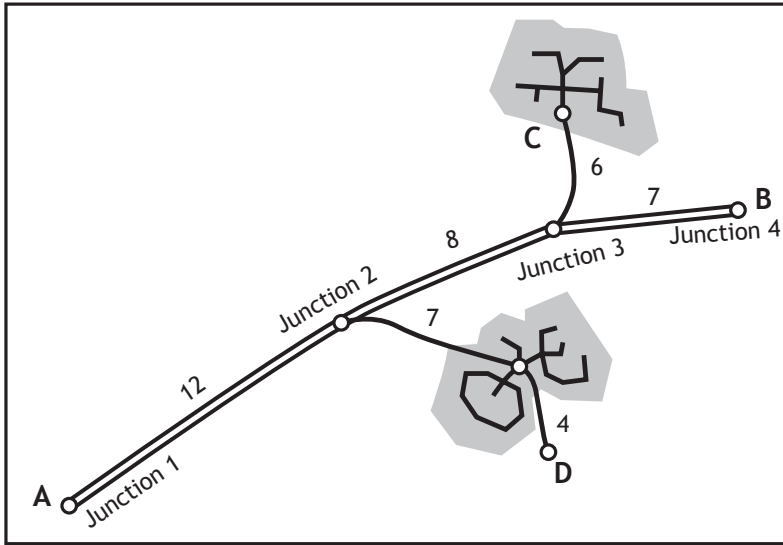Explain why the file size of the photograph is reduced when the *resolution* is reduced. **1**

_____

_____

**Total marks** **8**

**17.** Road maps display the distance, in miles, between two points as a whole number.



To calculate the total length of a journey between two places on the map, all sections of the journey are added together.

In the map shown, it is 23 miles (12+7+4) from A to D.

A program is designed to calculate the total length of a journey from a list of map distances. Journeys always start at A.

```
Line 1.    SET total TO 0
Line 2.    RECEIVE destination FROM keyboard
Line 3.    REPEAT
Line 4.        RECEIVE distance FROM keyboard
Line 5.        SET total TO total + distance
Line 6.    UNTIL distance = 0
Line 7.    SEND ["The distance between A and
           ",destination," is ",total," miles"] TO
           DISPLAY
```

(a) (i) The above design was created using *pseudocode*. Name another *design notation* that could have been used instead. **1**

_____

(ii) Describe **one** advantage of using this *design notation* rather than *pseudocode*. **1**

_____

_____

**Question 17 (continued)**

(b) Identify the *variables* and state their *data types* used in the program design. **3**

| Variable | Data type |
|---|---|
| 1. _____ | _____ |
| 2. _____ | _____ |
| 3. _____ | _____ |

(c) List the *test data* that should be entered to test that the program correctly calculates the distance from A to C. **2**

_____

_____

(d)
```
Line 1.  SET total TO 0
Line 2.  RECEIVE destination FROM keyboard
Line 3.  REPEAT
Line 4.       RECEIVE distance FROM keyboard
Line 5.       SET total TO total + distance
Line 6.  UNTIL distance = 0
```

The program above stops when the user enters 0.

The design is to be improved to display a warning message if the total is greater than 50.

Use pseudocode or a programming language of your choice to show how this extra feature could be implemented. **3**

**Total marks 10**

18. The Lumecy Theatre homepage is shown below. It provides access to the four main sections of their website — What's On, Performers, Your Visit and Box Office. It also allows customers to go to the website of their sponsor.
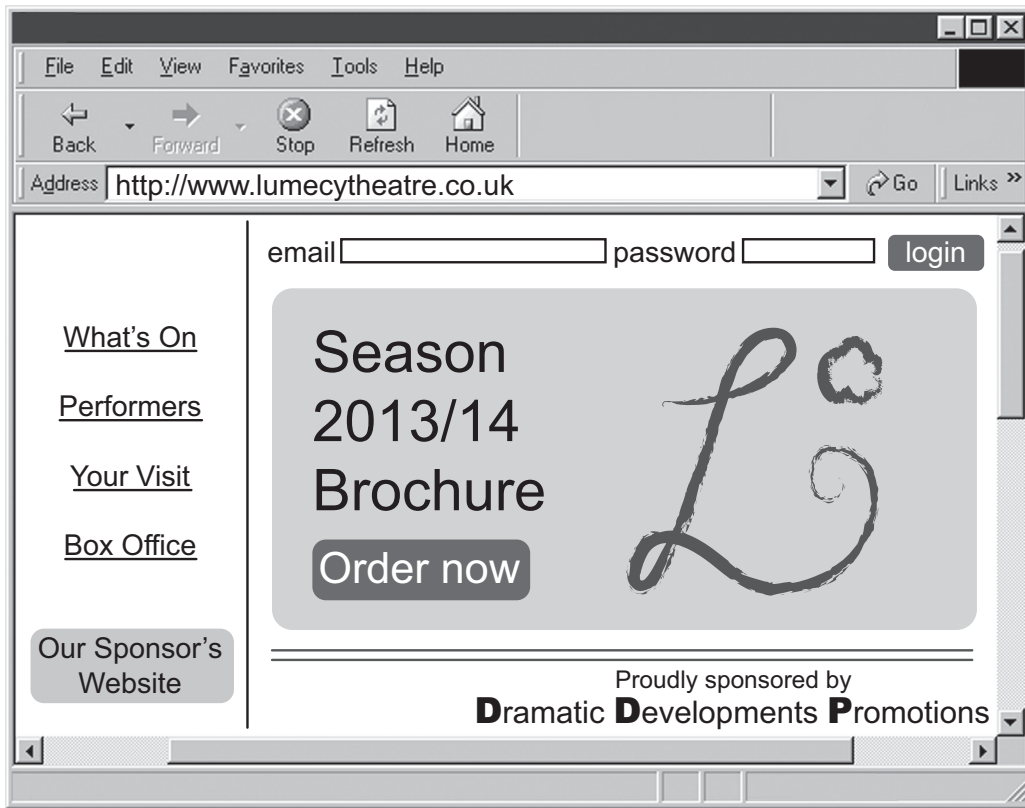


(a) The *hyperlinks* are checked to make sure each one leads to the correct **web page**.

Describe **one** other test that should have taken place when this **web page** was being developed.

**1**

(b) Explain, using examples from the web pages above, the difference between an *internal hyperlink* and an *external hyperlink*.

**2**

**Question 18 (continued)**

Here are two sample pages from the Lumecy Theatre website.

| $\mathcal{L}$     What's On | $\mathcal{L}$     Box Office |
|---|---|
| The Old Timers    Details<br><br>A Shot in the Dark    Details<br><br>The Butterfly Band in Concert    Details<br><br>The Unknown Play    Details | Select your performance date<br>**MAY**     **2013**<br>S M T W T F S<br>1 2 3 4<br>5 6 7 8 9 10 11<br>12 13 14 15 16 17 18<br>19 20 21 22 23 24 25<br>26 27 28 29 30 31<br>◄ Page 2 of 6 ► |
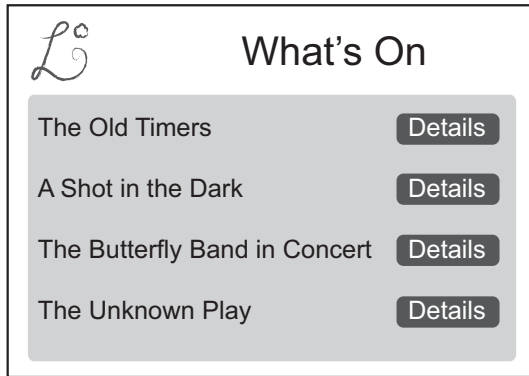
What's On web page         Box Office web page

(c) The two web pages above use different types of navigation.

Draw a diagram for each page to represent the navigation structure used. **2**

(d) Describe **one** element of good design that could be used to aid *accessibility* in the Lumecy website. **1**

_____

_____

**Question 18 (continued)**

(e) Lumecy stores details of its customers on a database.

(i) State **one** principle Lumecy must comply with in terms of the **Data Protection Act.**    **1**

_____

_____

(ii) Explain why compliance with this principle is important to **customers.**    **1**

_____

_____

**Total marks    8**

19. Modern cars are fitted with embedded (built-in) computers that perform a variety of functions. One of the latest functions automatically activates the brakes if the car gets too close to the car in front. For safety reasons this function is only activated at low speeds.

(a) Automatic braking requires sensors that measure the speed of the car and the distance between the two cars.

State the hardware that allows external devices to be connected to a computer system.    **1**

_____

**Question 19 (continued)**

(b) A program is required that will apply the car brakes if the distance between the two cars is less than 15 metres (m). For safety reasons, the brakes should only be activated if the speed of the car is less than 30 mph. The brakes should be kept on until the speed of the car is 0 mph.

23 mph

13·7 m
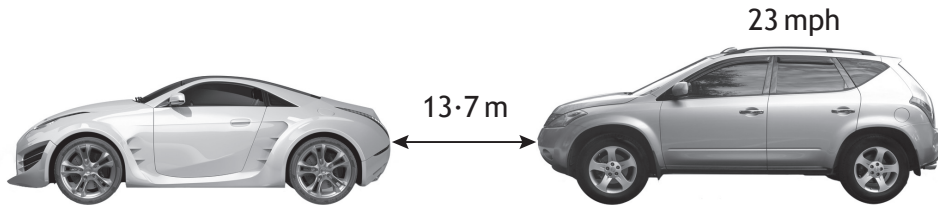
The *pseudocode* below shows a design for the program.

There are two errors in the logic of the program design. Find and describe each error made.

**2**

```
Line 1.    RECEIVE speed_of_car FROM (real) SENSOR
Line 2.    RECEIVE distance_to_car FROM (real) SENSOR
Line 3.    IF speed_of_car <30 OR distance_to_car<15 THEN
Line 4.    REPEAT
Line 5.        SEND apply brakes TO car brakes
Line 6.        RECEIVE speed_of_car FROM (real) SENSOR
Line 7.    UNTIL speed_of_car = 100
Line 8.    END IF
```

| Error | Line number | Description |
|-------|-------------|-------------|
| 1. | _____ | _____ |
|    | _____ | _____ |
| 2. | _____ | _____ |
|    | _____ | _____ |

**Question 19 (continued)**

   (c)  A program is written and tested using the following *test data*.

       (i)  Complete the table below to show four examples of *test data* and the type of each example. **3**

| Test data | Type of test data |
|---|---|
| car speed — 30 mph, distance — 15 m | |
| car speed — 14 mph, distance — 8 m | normal |
| car speed — 45 mph, distance — 17 m | |
| | exceptional |

     (ii)  Explain the purpose of fully testing a program using a variety of *test data*. **1**

_____

**Total marks**  **7**

**20.** Carlton Crafts employs a number of instructors to run courses for clients. Here is an example of the data stored about each instructor and the courses they run.

| Instructor ID | First Name | Surname | Date of birth | Expertise | Photo | Course ref | Title | Level | Course day |
|---|---|---|---|---|---|---|---|---|---|
| INS186 | Oliver | Jones | 12/11/85 | Painting | | DR234 | Basic Drawing | Beginner | Monday |
| INS187 | Susan | Kyama | 25/11/87 | Enamel | | CR657 | Jewellery Gifts | Advanced | Tuesday |
| INS186 | Oliver | Jones | 12/11/85 | Painting | | DR254 | Painting Landscapes | All levels | Wednesday |
| INS188 | Andrew | Cheng | 09/09/90 | Pottery | | PY675 | Drawing | Beginner | Tuesday |

A decision is made to store this data in a database.

**MARKS**

(a) Describe one reason why a database with *linked tables* would be better than a *flat file* for storing this data.

**1**

_____

_____

(b) A design with two tables is created—INSTRUCTOR table and COURSE table.

  (i) Identify a suitable *primary key* for each table.

**2**

_____

_____

  (ii) Explain why it is necessary to have a *foreign key*.

**1**

_____

_____

**Question 20 (continued)**

(c)  Name **two** different *field types* required to store the data shown.    **2**
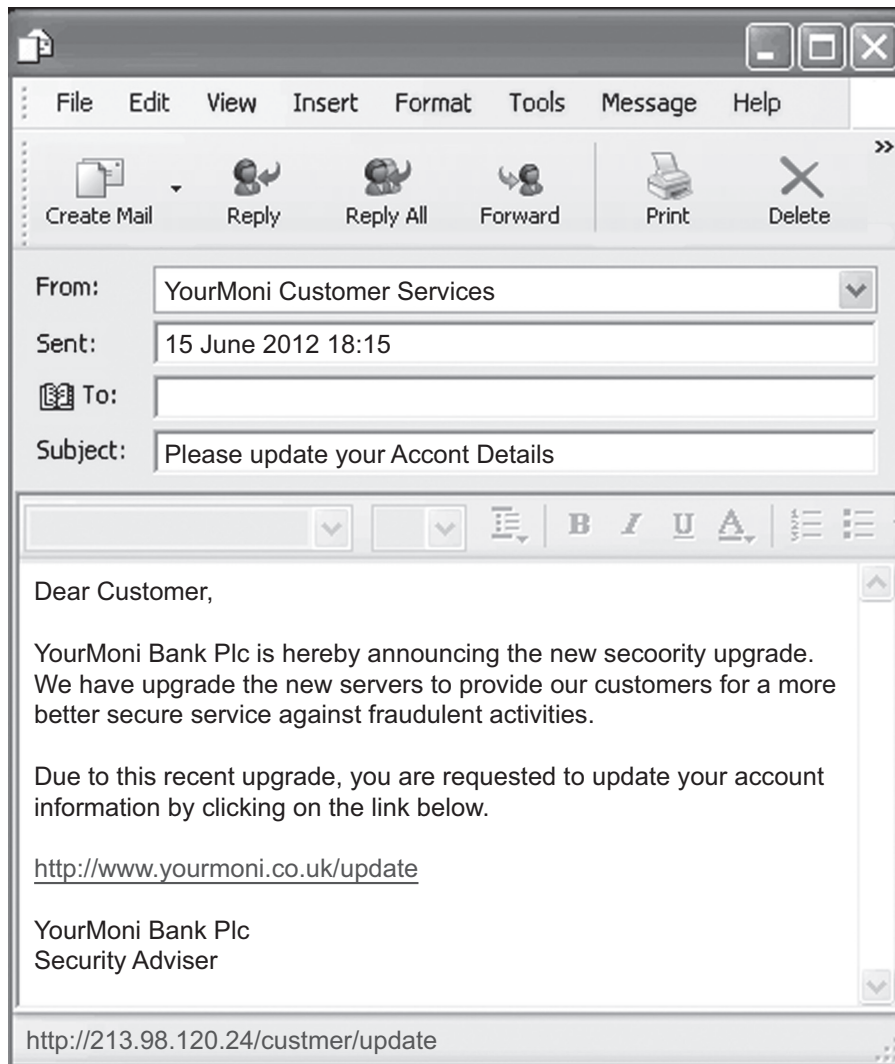
_____

_____

(d)  Name and describe a type of *validation* that could be used on the field called "Course day".    **2**

_____

_____

The following e-mail is received by one of the instructors who is a registered customer of YourMoni Bank Plc.

| File   Edit   View   Insert   Format   Tools   Message   Help |
| --- |
| Create Mail    Reply    Reply All    Forward    Print    Delete |

| | |
| --- | --- |
| From: | YourMoni Customer Services |
| Sent: | 15 June 2012 18:15 |
| To: | |
| Subject: | Please update your Accont Details |

Dear Customer,

YourMoni Bank Plc is hereby announcing the new secoority upgrade. We have upgrade the new servers to provide our customers for a more better secure service against fraudulent activities.

Due to this recent upgrade, you are requested to update your account information by clicking on the link below.

http://www.yourmoni.co.uk/update

YourMoni Bank Plc
Security Adviser

http://213.98.120.24/custmer/update

**Question 20 (continued)**

(e) Explain why the instructor might suspect this is not a genuine e-mail from the bank.  Your explanation should refer to **two** features of the email which could cause suspicion. **2**

_____

_____

_____

_____

(f) Explain why such e-mails pose a security risk if the recipient clicks on the link. **2**

_____

_____

**Total marks  12**

**21.** A programming language provides the following built-in functions.

move(n)        n = distance moved in pixels

turn(d)        d = degrees turned (positive means clockwise)

pen_down()    starts drawing line

pen_up()      finishes drawing line

These can be used by the programmer to draw lines.

An example program, its output and notes on the output are shown below.

| | OUTPUT |
|---|---|
| ```
pen_down()
REPEAT 4 TIMES
   move(100)
   turn(-90)
END REPEAT
pen_up()
``` | Each movement is 100 pixels long<br><br>Direction of first move<br><br>Starting point |

(a) Assuming the initial move direction is up the screen, draw the output that would be created by the following program.

**3**

| | OUTPUT |
|---|---|
| ```
pen_down()
REPEAT 2 TIMES
   move(30)
   turn(90)
   move(60)
   turn(-90)
END REPEAT
pen_up()
``` | |

**Question 21 (continued)**

(b) State the **type** of loop shown in the design. Justify your answer. **2**

_____

_____

(c) Once the program has produced a drawing on screen, the user can save a drawing as a bitmap with a resolution of 600x600 pixels in 8 bit colour.

Calculate the *storage requirements* of one of these saved *bitmapped graphics*. Give your answer in appropriate units.

Show your working. **3**

**Total marks 8**

**22.** The "Files in the Sky" website provides internet-based document storage. Before using the website, a user must set up a new account. The design for the new account input screen is shown below.

| | |
|---|---|
| First name | Textfield 1 |
| Surname | Textfield 2 |
| Date of birth | Text3 \| Text \| Text5 |
| Choose a user name | Textfield 6    * required |
| Create a password | Textfield 7    at least 8 characters |
| Confirm your password | Textfield 8 |
| | Sign me up! |

(a) (i) Using pseudocode or a language of your choice, show how a program could check that the password entered into textfield7 has at least eight characters. **3**

**Question 22 (a) (continued)**

(ii) Describe clearly, with reference to values and variables, what the following *pseudocode* does. **3**

```
Line 1    SET password_entered TO textfield7
Line 2    SET password_confirm TO textfield8
Line 3    IF password_entered = password_confirm
          THEN
Line 4         proceed to newuserscreen
Line 5    ELSE
Line 6         SEND ["error occurred"] TO DISPLAY
Line 7    END IF
```

(b) Describe **two** advantages to a user deciding to use the "Files in the Sky" website rather than a USB flash drive to store documents. **2**

**Total marks 8**

**23.** A computer program is used to store a patient's heart rate each day for a week. The seven readings are stored in an array of real numbers called "bpm".

(a) Using pseudocode or a programming language of your choice, write a short program to calculate the average heart rate of the patient over the seven days. **3**

_____

_____

_____

_____

_____

_____

(b) The pseudocode below shows how the heart rate is entered.

```
Line 1    REPEAT
Line 2        RECEIVE bpm FROM keyboard
Line 3        IF bpm < 35 THEN
Line 4            SEND appropriate message TO display
Line 5        END IF
Line 6    UNTIL bpm >=35
```

Describe all the events that will occur if a user enters a negative value. **3**

_____

_____

_____

_____

_____

_____

_____

**Question 23 (continued)**

(c) The completed program is translated into *binary* using a compiler.

(i) State the name given to binary instructions.

**1**

_____

(ii) State **two** reasons why a *compiler* is used to translate the completed program.

**2**

_____

_____

_____

_____

**Total Marks** **9**

**[END OF SPECIMEN QUESTION PAPER]**

SQA

**Part One: General Marking Principles for National 5 Computing Science**

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question. The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer.*

**(a)**     Marks for each candidate response must <u>always</u> be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question.

**(b)**     Marking should always be positive, ie marks should be awarded for what is correct and not deducted for errors or omissions.

**Part Two: Marking Instructions for each question**

| Question | | | Expected response | Max mark | Additional guidance |
|---|---|---|---|---|---|
| **Section 1** | | | | | |
| **1** | | | 00011001 | 1 | |
| **2** | | | *Candidates need to ensure that their answer links directly to this question and explains about the telephone number. One of the following points needs to be given to obtain the mark.*<br><br>• The telephone number contains a leading zero which would be dropped if stored as a number<br>• The telephone number contains a space which is not valid in numeric field<br>• The telephone number will not be used for calculations | 1 | |
| **3** | | | Data Bus | 1 | |

| 4 | | | *In this question, naming the feature supports the candidate's answer, but does not gain any marks by itself. Linking the feature to the description does.* | 1 | |
|---|---|---|---|---|---|
| | | | *Examples of suitable answers are given below. The candidate must give a workstation feature and describe how it reduces a health risk.* <br> *One mark to be awarded for any one pair, eg:* | | |
| | | | | | |

| Feature | Reason |
|---|---|
| *tilt and swivel (adjustable) monitor* | *can be moved to the correct angle to prevent eye strain or squinting* |
| *ergonomically designed keyboard* | *enables user to keep hands and wrists in a natural position and avoid RSI* |

| 5 | | | *Description should be about the purpose of JavaScript: both the following points should be made to gain the two marks. eg:* <br> • JavaScript is used to add interactivity (one mark) to HTML/web pages (one mark) <br> • JavaScript is used to provide dynamic content (one mark) to HTML/web pages (one mark) | 2 | |
|---|---|---|---|---|---|
| 6 | | | *Candidates need to provide both parts in their answer to gain the two marks.* <br><br> Megapixels in descending order (one mark) <br><br> Price in ascending order (one mark) | 2 | |
| 7 | | | *Candidates need to show clearly in their answer the data structure and the data type to demonstrate their understanding.* <br><br> Data structure = Array (one mark) <br> Data type = Real (one mark) | 2 | |
| 8 | | | HTML | 1 | |

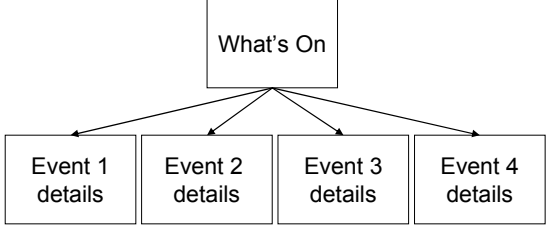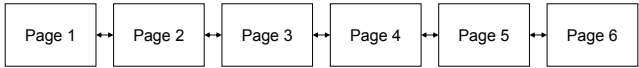| 9 | a | | The candidate must show in their answer that they understand what is meant by a Denial of Service Attack.<br><br>Flooding the server with a large number of requests (one mark) | 1 | |
|---|---|---|---|---|---|
| 9 | b | | The candidate must make reference to an effect on the user.<br><br>It would result in the server being unavailable to its intended users (one mark) | 1 | |
| 10 | | | The candidate needs to link their answer to security. One clear benefit would be awarded one mark, eg:<br><br>• Eliminate problems caused by lost IDs or forgotten passwords by using physiological attributes<br>• Prevent unauthorised use of lost, stolen or "borrowed" ID cards<br>• Reduce fraud by employing hard-to-forge technologies and materials<br>• Replace hard-to-remember passwords which may be shared or observed | 1 | |
| 11 | | | Question asks about operating system design, answer needs to look at technology. (This question allows the candidate to look at operating systems in the current time so marking scheme will be relevant to the operating systems at time of marking.)<br><br>Any one from the following would be relevant at time of publication:<br><br>• smartphone/tablet—operating system must have low hardware requirements<br>• smartphone/tablet—operating system must deal with input from a different range of input devices<br>• smartphone/tablet is a battery powered device so managing power consumption is particularly important | 1 | |

| 12 | | | *Candidate answer could refer to either data eradication or compliance with legislation, eg:* *Data eradication* to comply with legislation such as Data Protection Act. *Candidate should include one issue for one mark.* <br><br>• ensure data is wiped from hard disks before disposal <br>• ensure personal data is not passed to future users if hard disk drive (HDD) is recycled <br>• physical destruction of disks if software cannot be used to remove data <br><br>OR: <br><br>*Compliance with legislation* such as the Waste Electrical and Electronic Equipment Directive (WEEE): <br><br>*Candidate should include one issue for one mark.* <br><br>• assess the environmental impacts of computer disposal and recycling services <br>• safe disposal of hazardous waste such as CRT monitors <br>• recycling of circuit boards and chips to cut down carbon footprint <br>• CRTs, LCD displays, printed circuit boards, batteries and flame retardant plastics are pre-treated before disposal | 1 | |
| 13 | | | *Candidate has to show an understanding of the role of the file server with reference to the client server network—link fileserver and client server network.  One mark for one point, eg:* <br><br>• Server controls the level of access that client PCs have to shared resources <br>• Server provides central storage for all network users | 1 | |
| 14 | | | *This question required the candidate to state techniques for readability.  Any two from (one mark each):* <br><br>• Comment lines <br>• Keywords capitalised <br>• Code indented <br>• Use meaningful variable names | 2 | |
| 15 | | | Memory | 1 | |

| 16 | a | | A description of any two advantages of smartphone over a desktop PC for tourists:<br><br>• Size/weight—smartphone fits into pocket and is easily carried on holiday<br>• Internet connection using 3G—access almost anywhere—tablet might only connect using wi-fi network<br>• Ability to make calls—can contact locations referred to in app using same device<br>• Messaging—can book transport or tickets and get confirmation message sent directly to phone | 2 | |
|---|---|---|---|---|---|
| 16 | b | | A description of interface feature supported by a judgement of its suitability for smart phone. Evaluations could indicate reasons why interface is suitable for smart phone.<br><br>• user friendliness<br>• straightforward navigation<br>• consistent design of elements and text<br>• good visual layout<br><br>Comments could indicate reasons why interface is not suitable for smart phone.<br>Size of smartphone screen too small for good viewing of output, especially maps.<br><br>One mark for each valid point up to a maximum of two. | 2 | |
| 16 | c | | Answer must name parts used to store real numbers.<br><br>Mantissa and exponent<br><br>One mark for each part. | 2 | |
| 16 | d | i | Answer should name any standard file format for photos such as jpeg.<br><br>One mark for valid file format. | 1 | |
| 16 | d | ii | An explanation that indicates file size reduction is due to lower number of pixels that make up the image. | 1 | |

| 17 | a | i | *Any one from:*<br><br>Structure chart<br>Flow chart | 1 | |
|----|---|----|------|---|---|
| 17 | a | ii | *Should relate to answer 17(a) above.*<br><br>A flow chart/structured chart gives a visual representation of the sequence of processes/events. | 1 | |
| 17 | b | | <table><tr><th>Variable</th><th>Data type</th></tr><tr><td>total</td><td>integer</td></tr><tr><td>distance</td><td>integer</td></tr><tr><td>destination</td><td>string</td></tr></table><br>*Three marks for all three correct, one mark for each correct pair.* | 3 | |
| 17 | c | | 12,8,6 (one mark)<br><br>0 to finish input (one mark) | 2 | |
| 17 | d | | *Candidate needs to show the following statements to achieve marks. One mark for each stage.*<br><br>IF statement (one mark)<br><br>Condition of total>50 (one mark)<br><br>Suitable output message (one mark) | 3 | |

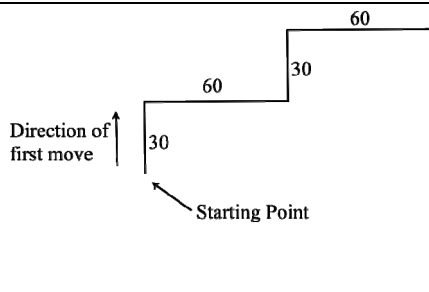| 18 | a | | A description that refers to the test being carried out on an element from the web page shown. | 1 | |
|----|---|---|---|---|---|
| | | | • Check Order Now button—ensure script executes correctly, and links to correct data entry form (one mark).<br>• Check login button—ensure script executes correctly, data entered is validated correctly (one mark).<br>• Check screen matches design—ensure correct elements on page, ensure spelling is accurate, ensure elements layout is correct (one mark).<br><br>Any one description for one mark. | | |
| 18 | b | | An explanation that indicates destination of hyperlink, supported by appropriate anchor from the web page shown.<br><br>Identity of internal hyperlink—in this case, link to What's On page or Performers page or Your Visit page or Box Office page.<br>Explanation: points to a file within a website (one mark).<br><br>Identity of external hyperlink—in this case, link to Our Sponsor's website.<br>Explanation: points to another website (one mark).<br><br>One mark for correct internal anchor and indication of destination.<br>One mark for correct external anchor and indication of destination. | 2 | Candidates are asked to use examples from the web page given to support their explanation. |

| 18 | c | |  (hierarchical)  (linear) Labelled diagram of navigation map for each page. *One mark for each correct map.* | 2 | |
|---|---|---|---|---|---|
| 18 | d | | *A description of web page feature that helps user access information such as:* • Screen magnification/zoom feature to enlarge what is displayed on the computer monitor, making it easier to read for vision impaired users. • Voice output option to read text on page making it easier for users with reading or learning difficulties. • Voice output option to read out text and commands available so site can be used by blind and vision impaired users. • Careful choice of colour scheme helps avoid problems with colour blindness and some low vision eyesight issues. • Careful choice of font helps readability. *One mark for any appropriate feature.* | 1 | |

| 18 | e | i | *Response should state any one of the eight principles to be met by data controllers under Data Protection Act.*<br><br>• Personal data must be processed fairly and lawfully<br>• Personal data must be obtained for specified and lawful purposes<br>• Personal data must be adequate, relevant and not excessive<br>• Personal data must be accurate and up to date<br>• Personal data must not be kept any longer than necessary<br>• Personal data must be processed in accordance with the data subject's rights<br>• Personal data must be kept securely<br>• Personal data must not be transferred to any other country without adequate protection in situ | 1 | |
| --- | --- | --- | --- | --- | --- |
| 18 | e | ii | *An explanation that includes why the principle stated in 18e(i) is important to customers.*<br><br>Customers are concerned about the amount of data stored, about how the data is used and how long it is kept. Compliance with DPA reassures customers that companies are handling their data in an appropriate manner, taking precautions against threats against computer security and ensuring data is correct.<br><br>• Personal data must be processed fairly and lawfully.<br>   o Customers will not be deceived or misled as to why the information is needed and will have to give their permission for data to be stored.<br>• Personal data must be obtained for specified and lawful purposes.<br>   o Customers know what their data is being used for and that it cannot be used for any other unrelated purpose, or that their data cannot be given away or sold without them knowing.<br>• Personal data must be adequate, relevant and not excessive.<br>   o Customers will be able to know exactly what data items are kept about them and the reason they are kept so that they do not need to divulge other personal information. | 1 | |

| | | | | |
|---|---|---|---|---|
| | | | <ul><li>Personal data must be accurate and up to date.<ul><li>Customers know that inaccurate, incorrect, or out-of-date data will not be used by the company.</li></ul></li><li>Personal data must not be kept any longer than necessary.<ul><li>Customers know that their data will be destroyed after a certain period of time.</li></ul></li><li>Personal data is processed in accordance with the data subject's rights.<ul><li>Customers know that they have the right to see their own data, check its accuracy, prevent processing that may cause harm/distress, and can claim compensation for any damage caused by breach of legislation.</li></ul></li><li>Personal data must be kept securely.<ul><li>Customers are assured that their data is only accessible to those with permission to process it, and not accessible to anyone else.</li></ul></li><li>Personal data must not be transferred to any other country without adequate protection in situ.<ul><li>Customers know their data cannot be passed outside the EU unless the country that the data is being sent to has a suitable data protection law.</li></ul></li></ul> | | |

| 19 | a |    | Interface | 1 |    |
|----|---|----|-----------|---|----|
| 19 | b |    | *Candidate needs to state clearly what happens on each of line 3 and line 7 for one mark each.*<br><br>Line 3, OR should be AND (one mark)<br>Line 7, speed_of_car = 100 should be speed_of_car = 0 (one mark) | 2 |    |
| 19 | c | i | <table><thead><tr><th>Test data</th><th>Type of test data</th></tr></thead><tbody><tr><td>car speed – 30 mph, distance – 15 m</td><td><strong>extreme</strong></td></tr><tr><td>car speed – 14 mph, distance – 8 m</td><td>normal</td></tr><tr><td>car speed – 45 mph, distance – 17 m</td><td><strong>normal</strong></td></tr><tr><td><strong>car speed – "Bernard", distance – "-12 m"</strong></td><td>exceptional</td></tr></tbody></table><br>*One mark for each answer in **bold** font.* | 3 | Note that exceptional data could be negative values, not a real number, or values so high as to be impossible, eg car speed—1,000 mph.<br><br>This is just one example of a potential answer. |
| 19 | c | ii | To ensure that the program can cope with a variety of input without crashing. | 1 |    |
| 20 | a |    | *A description that indicates reason for linking tables with reference to data in the question. Any one from:*<br><br>• Less data duplication with linked tables — details of instructor will only be entered once.<br>• Less inconsistency in data due to less duplication – as name of instructor only entered once, then only one version exists.<br>• Better data integrity.<br>• Removes multi-value fields — more than one set of course details for an instructor so they should be moved to separate table.<br>• Easier to search single value fields — without linking tables course detail field will contain several values which make searching difficult.<br><br>*One mark for valid reason.* | 1 | MUST link to question in the candidate answer |

| 20 | b | i | A named field is identified as the primary key for each table.<br><br>Primary Keys<br>INSTRUCTOR      Instructor ID (one mark)<br>COURSE         Course Reference (one mark)<br><br>*One mark for each table and primary key.* | 2 | |
| 20 | b | ii | *An explanation that covers why foreign key is necessary.*<br><br>To enable tables to be linked—foreign key is the primary key in other table. | 1 | |
| 20 | c | | *Response must name two data types that are suitable for the data in the scenario.*<br>*Any two from:*<br><br>Text<br>Date<br>Graphic (or object)<br><br>*One mark for each correct data type to maximum of two.* | 2 | |
| 20 | d | | *Candidate must specify the correct type of validation check using appropriate terminology and provide details of how it is used in this example.*<br><br>Type of validation:  Restricted choice<br>Description of use: Limits values that can be entered to a list of acceptable value (days of week)<br><br>*One mark for type of validation.*<br>*One mark for description of use.* | 2 | |

| 20 | e | | Candidate must identify two features in the email and give a reason why each might be suspicious.<br><br>• Subject "Please update account" – not usual for company to ask this<br>• Dear Customer—registered customer would be addressed by specific reference not generic term<br>• Click the link—URL stated in link is different to actual URL transferred to<br>• Incorrect use of spelling and grammar—not used by professional business<br><br>*One mark for each feature and its explanation up to maximum of two.* | 2 | |
| 20 | f | | *An explanation that demonstrates understanding of the security risks if the link is clicked.*<br>*Any two from:*<br><br>• Phishing email<br>• Attempt by hackers to gain personal login details to access bank account<br>• Redirect to unofficial site where customer enters details and sends them directly to hacker<br>• Hacking of account details may lead to online fraud or identity theft<br><br>*One mark for any correct explanation.* | 2 | |
| 21 | a | | | 3 | |

```
pen_down()
REPEAT 2 TIMES
    move(30)
    rotate(90)
    move(60)
    turn (-90)
END REPEAT
pen_up()
```



Staircase shape with four lines (one mark)
Correct distances of 30 and 60 noted (one mark) (one example of each is enough)
Starting point (one mark)

| 21 | b | | Fixed loop (one mark)<br><br>Explanation of program loops a fixed number of times (ie twice) (one mark) | 2 | |
|---|---|---|---|---|---|
| 21 | c | | 600 x 600 bytes (one mark) (8 bits per pixel)<br>360000/1024 kilobytes (one mark)<br>351.6 kilobytes (one mark) | 3 | |
| 22 | a | i | IF length of textfield7 >=8 THEN<br>      SET valid TO true<br>    END IF<br><br>One mark for the IF<br>One mark for the 'length of textfield7 >=8<br>One mark for the SET value TO true<br><br>Alternative answers are possible. Marks to be awarded for correct use of IF, correct use of condition involving textfield7 and a correct action as a result eg setting a flag variable. | 3 | |
| 22 | a | ii | *A description that covers the following points:*<br><br>Values entered on form for "Create a password" and "Confirm your password" assigned to variables (one mark)<br><br>If statement used to compare these variables (one mark)<br><br>If the values match then a screen is shown confirming registration, otherwise an error message is displayed (one mark)<br><br>*One mark for each bullet point.* | 3 | |
| 22 | b | | *A description that covers two reasons why cloud storage is better than USB storage.*<br><br>Cloud storage is less vulnerable to loss, damage or theft than USB flash drive<br><br>Cloud storage scalable to requirements rather than fixed capacity of a USB flash drive<br><br>Cloud storage solutions include automatic backup of data whereas you need to set up a backup routine yourself with a USB flash drive<br><br>*One mark for any two valid points.* | 2 | |

| 23 | a | | For days 1–7 | 3 | |
|----|---|---|---|---|---|
| | | |     let total= total+bpm (days) | | |
| | | | next days | | |
| | | | let average bpm=total/7 | | |
| | | | One mark for unconditional loop—seven times.<br>One mark for running total using array.<br>One mark for calculating average. | | |
| 23 | b | | *Clear description must identify the following for all three marks:*<br><br>• Implementation of conditional loop and the fact that condition is NOT met as number entered negative (one mark).<br>• Input value from keyboard (one mark).<br>• If statement with condition being met as data entered is negative, a negative error message is displayed and user asked to re-enter (one mark). | 3 | |
| 23 | c | i | Machine code | 1 | |
| 23 | c | ii | *Any two from:*<br>Creates standalone executable code<br>Code will execute faster<br>Can create portable code | 2 | |

**[END OF SPECIMEN MARKING INSTRUCTIONS]**