

Cambridge International Examinations

Cambridge International Advanced Subsidiary and Advanced Level

| CANDIDATE NAME | | | |
|-------------------|----------------------------|---------------------|-----------------|
| CENTRE NUMBER | | CANDIDATE NUMBER | |
| COMPUTER SO | CIENCE | | 9608/12 |
| Paper 1 Theory | [,] Fundamentals | Octobe | r/November 2015 |
| | | 1 | hour 30 minutes |
| Candidates ans | wer on the Question Paper. | | |
| No Additional M | laterials are required. | | |
| No calculators a | allowed. | | |

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

No marks will be awarded for using brand names of software packages or hardware.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The maximum number of marks is 75.



| 1 | (a) | Examples of primary and secondary storage devices include: |
|---|-----|--|
| | | hard disk |
| | | • DVD-RW |

flash memory

| | For each device, describe the type of media used. | |
|-----|---|-----|
| | Hard disk | |
| | | |
| | | |
| | DVD-RW | |
| | | |
| | Flash memory | |
| | | [3] |
| | | |
| (b) | Describe the internal operation of the following devices: | |
| | DVD-RW | |
| | | |
| | | |
| | | |
| | | |
| | DVD-RAM | |
| | | |
| | | |
| | | |
| | | [4] |

| 2 | (a) | Describe how a laser mouse operates. |
|---|-----|--------------------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | [3 |
| | | |

(b) The following table shows a list of five statements which describe the stages when a page is printed using an inkjet printer.

Put each statement in the correct sequence by writing the numbers 1 to 5 in the right-hand column.

| Statement | Sequence number |
|---|--------------------|
| Paper feed stepper motor activated; sheet of paper fed from paper tray | |
| Printer driver translates data into a suitable format for the printer | |
| The print head moves across the page; ink is sprayed each time the print head pauses for a fraction of a second | |
| Paper feed stepper motor advances paper a fraction of a cm after each complete head pass | |
| Printer receives data from the computer and stores the data in the printer's buffer | |

[5]

| 3 | A 4I I | nas three squares | | i | la a .aa a al a . |
|----|-------------------|--------------------|-------------|---------------|-------------------|
| -4 | A MILION SCREEN I | iae inree enijaree | where a se | iection can | ne mane: |
| • | / \ | ias illice sauaies | wilcic a sc | icciicii caii | Do mado. |

| S | Т | U |
|---|---|---|
| | | |

(a) The x-coordinate of the centre of the three squares is held in three memory locations:

S T

U

| Address | Memory contents |
|---------|-----------------|
| 40 | 0000 1011 0100 |
| 41 | 0010 0101 0100 |
| 42 | 0100 0110 1100 |

| | (i) | Give the hexadecimal value of the memory contents for U. | |
|-----|------|--|-----|
| | | | |
| | (ii) | Convert the denary number 40 into binary. | |
| | | | |
| (b) | Bitn | nap graphics are used to represent squares S, T and U. | ['] |
| | The | ese can be saved in a number of different image resolutions. | |
| | (i) | Give the number of bits required to store each pixel for a black and white bitmap. | |
| | | | [1] |
| | (ii) | Identify how many bits are required to store each pixel for a 256-colour bitmap. | |
| | | Explain your answer. | |
| | | | |
| | | | |
| | | | [2] |

4

| (a) | Sou | nd can be represented digitally in a computer. | |
|-----|------|--|-----|
| | Exp | lain the terms sampling resolution and sampling rate. | |
| | San | npling resolution | |
| | | | |
| | | | |
| | | | |
| | San | npling rate | |
| | Our | | |
| | | | |
| | | | |
| | | | 4] |
| (b) | The | following information refers to a music track being recorded on a CD: | |
| | | music is sampled 44 100 times per second each sample is 16 bits | |
| | | each track requires sampling for left and right speakers | |
| | (i) | Calculate the number of bytes required to store one second of sampled music. | |
| | | Show your working. | |
| | | | |
| | | | |
| | | | |
| | | | [2] |
| | (ii) | A particular track is four minutes long. | |
| | | Describe how you would calculate the number of megabytes required to store this trace | k. |
| | | | |
| | | | |
| | | | |
| | | | 21 |
| | | • | - |

| (c) | When storing music tracks in a computer, the MP3 format is often used. This reduces file size by about 90%. |
|-----|---|
| | Explain how the music quality is apparently retained. |
| | |
| | |
| | |
| | |
| | [3] |
| | [0] |

5 Bobby is a senior programmer at a software house which produces intruder detection software. He also runs his own software company which develops and sells various computer applications.

The following table shows seven activities which Bobby carries out.

Put a tick (\checkmark) in the appropriate column to identify if the activity is ethical or unethical.

| Activity | Ethical | Unethical |
|---|---------|-----------|
| Gives away passwords used in the intruder detection software | | |
| Uses source code developed at the software house for the software he develops for his own company | | |
| Insists that staff work to deadlines | | |
| Turns down training opportunities offered by his employer | | |
| Writes and sells software that reads confidential data from client computers | | |
| Fakes test results of safety-critical software | | |
| Has the software applications developed overseas for sale in his own country | | |

[7]

| 6 | (a) | | scribe the stored program concept for the basic Von Neumann model for a comptem. | outer |
|---|-----|------|--|-------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | (b) | (i) | Name the three types of bus used by a processor. | |
| | | | 1 | |
| | | | 2 | |
| | | | 3 | [3] |
| | | (ii) | State the function of the system clock in a processor. | |
| | | | | |
| | | | | |
| | | | | [1] |

7 An amusement park has a website. This includes a page where potential visitors can enquire about the price for an individual or group visit.

The user can enter the number of people in their group.

The admission price will be calculated and displayed.

```
1
      <ht.ml>
2
      <head>
3
      <title>Amusement park visit ticket cost</title>
4
      </head>
5
      <body>
6
      Calculate my ticket price
7
      <Script Language = "JavaScript">
8
      var groupSize = prompt("Enter number of visitors in
      your group)", "");
9
      var groupPrice = groupSize * 20;
      if (groupSize > 4)
10
11
12
      groupPrice = groupPrice * 0.8;
13
14
      alert("Price for the group is " + groupPrice);
15
      alert("Thank you for your enquiry");
      </Script>
16
17
      </body>
      </html>
18
```

| (a) | Give the range of line numbers in the web page script that are JavaScript code. | | |
|-----|---|--|-----|
| (b) | (i) | Give the identifiers of two variables which have been used by the programmer. | |
| | | 2 | |
| | (ii) | Give the range of line numbers where selection is performed. | |
| (c) | Exp | olain the use of the following in JavaScript. | [1] |
| | (i) | the prompt function | |
| | | | |
| | (ii) | the var keyword | |
| | | | ا |

| Verification and validation can be applied during data entry. |
|---|
| Describe what is meant by these terms. For each method, explain why it is needed. |
| Verification |
| |
| |
| |
| |
| Validation |
| |
| |
| |
| [4] |

| 9 | (a) | An IP | address | has the | following | value. |
|---|-----|--------------|---------|---------|-------------|--------|
| 9 | (a) | \neg 11111 | auuless | nas me | IUIIUVVIIIU | value. |

11.64.255.90

| | | [4] |
|-----|------|--|
| | (ii) | Explain the format of an IP address. |
| | | |
| | | |
| | | |
| | | [2] |
| (b) | Stu | dy the following sentence: |
| | | nen a user enters a URL into their web browser, the DNS service locates the required ource." |
| | Exp | plain how a URL and DNS are used to locate a resource. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | [4] |

| Before it is used, a hard disk is formatted using disk formatter software. | | |
|---|--|--|
| Explain why formatting is needed. | | |
| | | |
| | | |
| | | |
| [2] | | |
| Eventually, the performance of the hard disk deteriorates. | | |
| Name three other utility programs that might be required. State why each is needed. | | |
| 1 | | |
| | | |
| | | |
| | | |
| 2 | | |
| | | |
| | | |
| | | |
| 3 | | |
| | | |
| | | |
| | | |
| | | |

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