

CANDIDATE
NAME

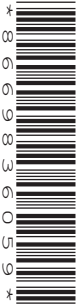
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CENTRE
NUMBER

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COMPUTER SCIENCE

9608/12

Paper 1 Theory Fundamentals

October/November 2015

1 hour 30 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators 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.

This document consists of **12** printed pages.

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.

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.....[3]

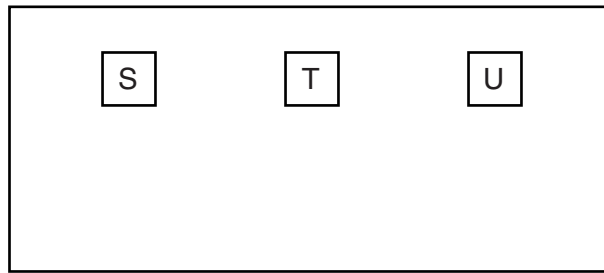
- (b) The following table shows a list of five statements which describe the stages when a page is printed using an inkjet printer.

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 touch screen has three squares where a selection can be made:



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

	Address	Memory contents
S	40	0000 1011 0100
T	41	0010 0101 0100
U	42	0100 0110 1100

- (i) Give the hexadecimal value of the memory contents for U.

.....
[1]

- (ii) Convert the denary number 40 into binary.

.....
[1]

- (b) Bitmap graphics are used to represent squares S, T and U.

These 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) Sound can be represented digitally in a computer.

Explain the terms sampling resolution and sampling rate.

Sampling resolution

.....

.....

.....

Sampling rate

.....

.....

.....[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 track.

.....

.....

.....

.....[2]

- (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]

- 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 (✓) 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) Describe the stored program concept for the basic Von Neumann model for a computer system.

.....

.....

.....

.....

.....[3]

- (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  <html>
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;
10 if (groupSize > 4)
11 {
12   groupPrice = groupPrice * 0.8;
13 }
14 alert("Price for the group is " + groupPrice);
15 alert("Thank you for your enquiry");
16 </Script>
17 </body>
18 </html>
```

- (a) Give the range of line numbers in the web page script that are JavaScript code.

.....[1]

- (b) (i) Give the identifiers of **two** variables which have been used by the programmer.

1

2 [2]

- (ii) Give the range of line numbers where selection is performed.

.....[1]

- (c) Explain the use of the following in JavaScript.

- (i) the `prompt` function

.....
.....[2]

- (ii) the `var` keyword

.....
.....[2]

- 8 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:

11.64.255.90

- (i) Write the above IP address in hexadecimal.

.....[4]

- (ii) Explain the format of an IP address.

.....

[2]

- (b) Study the following sentence:

“When a user enters a URL into their web browser, the DNS service locates the required resource.”

Explain how a URL and DNS are used to locate a resource.

.....

[4]

10 Before it is used, a hard disk is formatted using disk formatter software.

(a) Explain why formatting is needed.

.....

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.....

.....[2]

(b) Eventually, the performance of the hard disk deteriorates.

Name **three** other utility programs that might be required. State why each is needed.

1

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2

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3

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[6]

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