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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
ADVANCED SUBSIDIARY GCE**

F451

COMPUTING

Computer Fundamentals

FRIDAY 15 MAY 2009: Morning

DURATION: 1 hour 30 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this paper is 100.**

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1 (a) State what is meant by each of the following:

(i) An input device

[1]

(ii) An output device

[1]

(b) A supermarket checkout terminal has both input and output devices.
State TWO input devices and TWO output devices which would be used at the checkout. In each case state why they would be used.

Input device 1 _____

[2]

Input device 2 _____

[2]

Output device 1 _____

_____ [2]

Output device 2 _____

_____ [2]

(c) Many customers carry a store loyalty card which is scanned at the checkout. The data collected is stored in the knowledge-base of a knowledge based (expert) system. State THREE other parts which will make up the knowledge based system and say why each part is necessary.

Part 1 _____

_____ [2]

Part 2 _____

_____ [2]

Part 3 _____

_____ [2]

2 (a) Describe TWO types of bus used for sending transmissions around a processor.

Type 1 _____

Type 2 _____

_____ **[4]**

(b) When data is transmitted from one location to another, different types of data transmission can be used.

(i) Describe the difference between serial and parallel data transmission.

[2]

(ii) Describe the difference between half duplex and duplex data transmission.

[2]

(c) Explain the differences between using packet switching and circuit switching to transmit a message.

[3]

3 Describe each of the following, stating a suitable use for each.

(i) MICR _____

_____ [2]

Use _____
_____ [1]

(ii) OCR _____

_____ [2]

Use _____
_____ [1]

(iii) OMR _____

_____ [2]

Use _____
_____ [1]

4 A systems analyst is employed to investigate the introduction of a new computer system to an organisation by carrying out a feasibility study.

(a) Describe THREE factors which the analyst should consider about the proposed system.

Factor 1 _____

_____ [2]

Factor 2 _____

_____ [2]

Factor 3 _____

_____ [2]

**(b) The analyst decides to use the spiral model of the systems life cycle.
Describe the spiral model.**

[2]

5 The thickness of sheets of glass produced by a manufacturing process is controlled by a computer which can adjust the distance apart of two rollers between which the glass is rolled. The thickness of the glass coming out from between the rollers is continually monitored by taking readings from sensors arranged above and below the glass.

(a) State what is meant by an actuator and how one would be used in this example.

Actuator _____

Use _____

_____ [2]

(b) (i) The glass is, nominally, 5 mm thick. The sensors measure the thickness and return the readings to the computer. Explain why the processor is NOT set to maintain the thickness at exactly 5 mm.

_____ [2]

(ii) State a sensible range between which the computer attempts to keep the thickness of the glass.

[1]

(c) Describe how the computer controls the thickness during the rolling process.

[5]

(d) The operator of the machine can alter the thickness from 5 mm, by inputting a different value to the computer. When the operator inputs new values it is important that the input is verified. Describe how the input can be verified in this example.

[2]

6 (a) Express the decimal number 95

(i) in binary in a single 8-bit byte

[2]

(ii) in binary coded decimal in a single 8-bit byte

[2]

(iii) as a hexadecimal number

[2]

(b) Using your answers to part (a), explain how binary representation of numbers can be used to determine the hexadecimal value.

[3]

7 A manufacturing company uses computers for both the manufacturing process and the tasks carried out in the offices.

**(a) The computerised manufacturing process is controlled by a single operator.
State THREE factors which should have been considered when designing the output interface for the operator. Give a reason for each.**

Factor 1 _____

_____ [2]

Factor 2 _____

_____ [2]

Factor 3 _____

_____ [2]

(b) The customer and order files used in the office are regularly backed up, while the data produced during operation of the manufacturing process is archived.

(i) Describe what is meant by backing up files, giving a reason why the customer and order files are backed up.

Backing up _____

_____ [2]

Reason _____

_____ [1]

(ii) Describe what is meant by archiving data, giving a reason why the data from the manufacturing process is archived.

Archiving _____

_____ [2]

Reason _____

_____ [1]

8 (a) Describe the characteristics of Local Area and Wide Area Networks (LANs and WANs).

[3]

TURN OVER FOR QUESTION 8(b)



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