

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Education
 January 2008
 Advanced Level Examination



COMPUTING
Unit 5 Advanced Systems Development

CPT5

Wednesday 23 January 2008 9.00 am to 10.30 am

You will need no other materials.
 You may use a calculator.

Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Show all your working.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 65.
- The marks for questions are shown in brackets.
- The use of brand names in your answers will **not** gain credit.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use			
Question	Mark	Question	Mark
1		5	
2		6	
3			
4			
Total (Column 1)		→	
Total (Column 2)		→	
TOTAL			
Examiner's Initials			



Answer **all** questions in the spaces provided.

1 When teachers in a large school need stationery items such as pens or folders, they help themselves from the stationery cupboard and write in a charge book what they have taken and which department they are working for. At the end of each month the finance clerk, Fred, charges the cost of the items to the relevant department. Fred is responsible for re-ordering items. A computing student, Susan, has been given the task of designing a computerised system for this.

(a) For each of the fact-finding techniques below, describe specifically how Susan might use the technique to analyse the current system (make sure that you include relevant personnel and facts in your answer where appropriate).

(i) interview

.....
.....
(1 mark)

(ii) survey

.....
.....
(1 mark)

(iii) examination of existing paperwork

.....
.....
(1 mark)

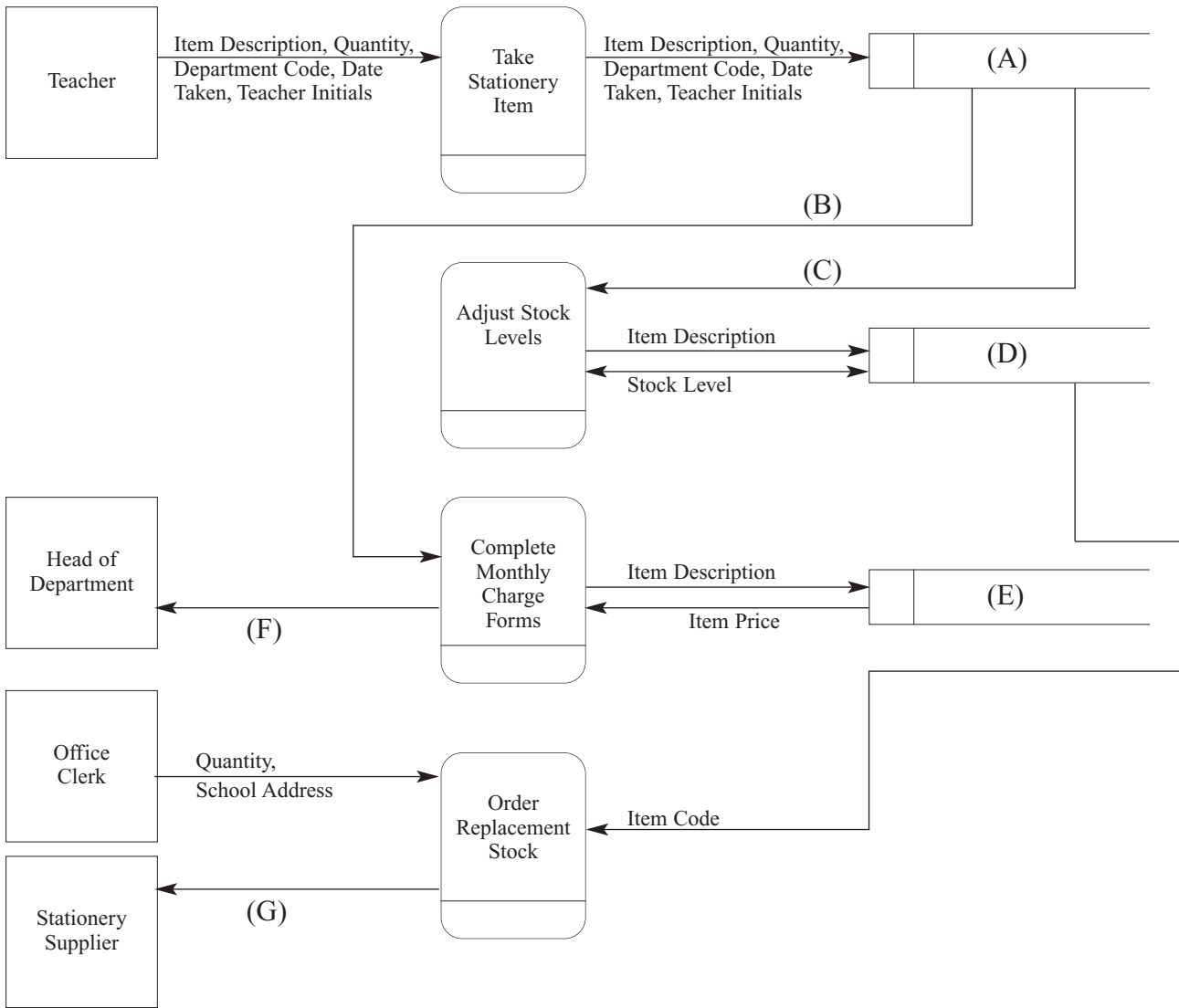
(iv) observation

.....
.....
(1 mark)

(b) From Susan's investigation, she found that when teachers **take a stationery item**, they enter the stationery's **item description** into a **charge book**, together with the **quantity** taken, the **department code**, the **date taken** and the **teacher's initials**. Every week, Fred checks the charge book to **adjust the stock levels** written in the **stock book**. If he notices that stock levels for any item are very low, he **orders replacement stock** for all those items that he thinks need restocking. Fred completes an order form with **item codes** and **quantities** and the **school's address** and sends it to the **stationery supplier**. When he **completes the monthly charge forms** for the departments, he looks up the **item price** from the **price list**. He fills in the charge form for each department with all the **item descriptions**, **quantities**, **item prices** and the **total** to be charged to each department. This is given to the **head of department**.



Figure 1



Complete the entries A–G on the appropriate lines below:

- (i) (A)
- (ii) (B)
- (iii) (C)
- (iv) (D)
- (v) (E)
- (vi) (F)
- (vii) (G)

(7 marks)

Question 1 continues on the next page

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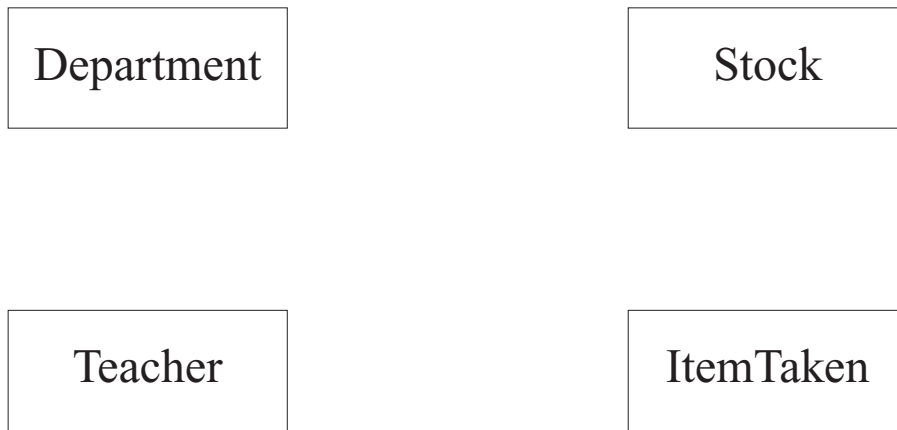


- (c) Susan decides that a relational database could be used to automate the adjustment of stock levels and the search for items that need replacing. The entities **Department**, **Teacher**, **Stock** and **ItemTaken** have been identified. Assume a teacher works for only one department.

The following details are to be stored about the **Department**, **Teacher** and **Stock**:

Department Code (unique)	Item Code
Department Name	Item Description
Head Of Department's Initials	Item Price
Teacher Initials (unique)	Quantity In Stock
First Name	Order Quantity
Surname	Minimum Stock Level

Show the degree of **three** relationships which exist between the given entities:



(3 marks)

- (d) Details to be stored about the items taken will need to include the date when the item was taken.

Using the following format

TableName (PrimaryKey, Non-keyAttribute1, Non-keyAttribute2, etc)

describe tables that model the following entities and their relationships, stating **all** attributes and underlining the primary key in each case.

- (i) Department (.....)
)
 (1 mark)



- 2 **Figure 2** shows the HTML for a web page that collects data through a screen-based form before submitting it to a server-based ASP script, Reply.asp.

Figure 2

```
<HTML>
<HEAD>
  <TITLE>New Members</TITLE>
</HEAD>

<BODY>
  <FORM METHOD="POST" ACTION="http://www.test.com/Reply.asp">
    <H2>Please enter your details <BR /> to register
      as a member</H2>
    <P>

      Please enter your name:
      <INPUT TYPE="text" NAME="MyName">
    </P>
    <P>
      <INPUT TYPE="submit" VALUE="Send Details">
    </P>
  </FORM>
  <P>
    <A HREF="http://www.test.com/Reply.asp?MyName=NoName">Cancel</A>
  </P>
</BODY>
</HTML>
```

- (a) With reference to the contents of **Figure 2** draw a labelled diagram to show the appearance of the web page when viewed through a web browser.

(6 marks)



Figure 3

```

<HTML>
  <HEAD>
    <TITLE>Thank you for registering</TITLE>
  </HEAD>

  <BODY>
    <%
      Member=Request.Form("MyName")
      Response.Write(Member)
    %>
  </BODY>
</HTML>

```

(b) The server-side script, Reply.asp shown in **Figure 3**, processes the data posted by the web browser.

(i) What is the value assigned to the variable **Member** when the script executes if the user:

(A) clicks the hyperlink in **Figure 2**?

.....
(1 mark)

(B) clicks the button after typing the name Jack?

.....
(1 mark)

(ii) What value does the script send as body text to the user's browser when the user:

(A) clicks the hyperlink in **Figure 2**?

.....
(1 mark)

(B) clicks the button after typing the name Emma?

.....
(1 mark)



3 A programmer has been asked to write a routine which will calculate a person's age **in years** from the date of birth supplied as a parameter to the routine and today's date, taken from the system.

The date of birth is supplied in the format dd/mm/yyyy and has already been checked by the system to be a valid date before it is passed to the routine.

No person is expected to be over 120 years old.

Suggest suitable values for each of the types of test data, *normal*, *boundary* and *erroneous*, and explain why you have chosen these values.

(a) **two** values of normal data:

(i) (ii)

reason for choice:

.....
.....

(3 marks)

(b) **three** values to check a boundary:

(i) (ii) (iii)

reason for choice:

.....
.....
.....

(4 marks)

(c) **one** value of erroneous data:

reason for choice:

.....
.....
.....

(2 marks)



- 4 (a) An IP address can be represented in the form w.x.y.z, where each letter represents the value of one byte of the IP address.
Some addresses have special uses, such as w.x.y.1, which by convention is the default gateway address.

Explain how the default gateway address is used by a host computer connected to a network.

.....

(2 marks)

- (b) Using the Domain Name System (DNS) we can refer to IP addresses by host name.
Explain the role of a Domain Name Server, which makes this possible.

.....

(2 marks)

4

- 5 Describe the principles of operation of a packet-switching network.

.....

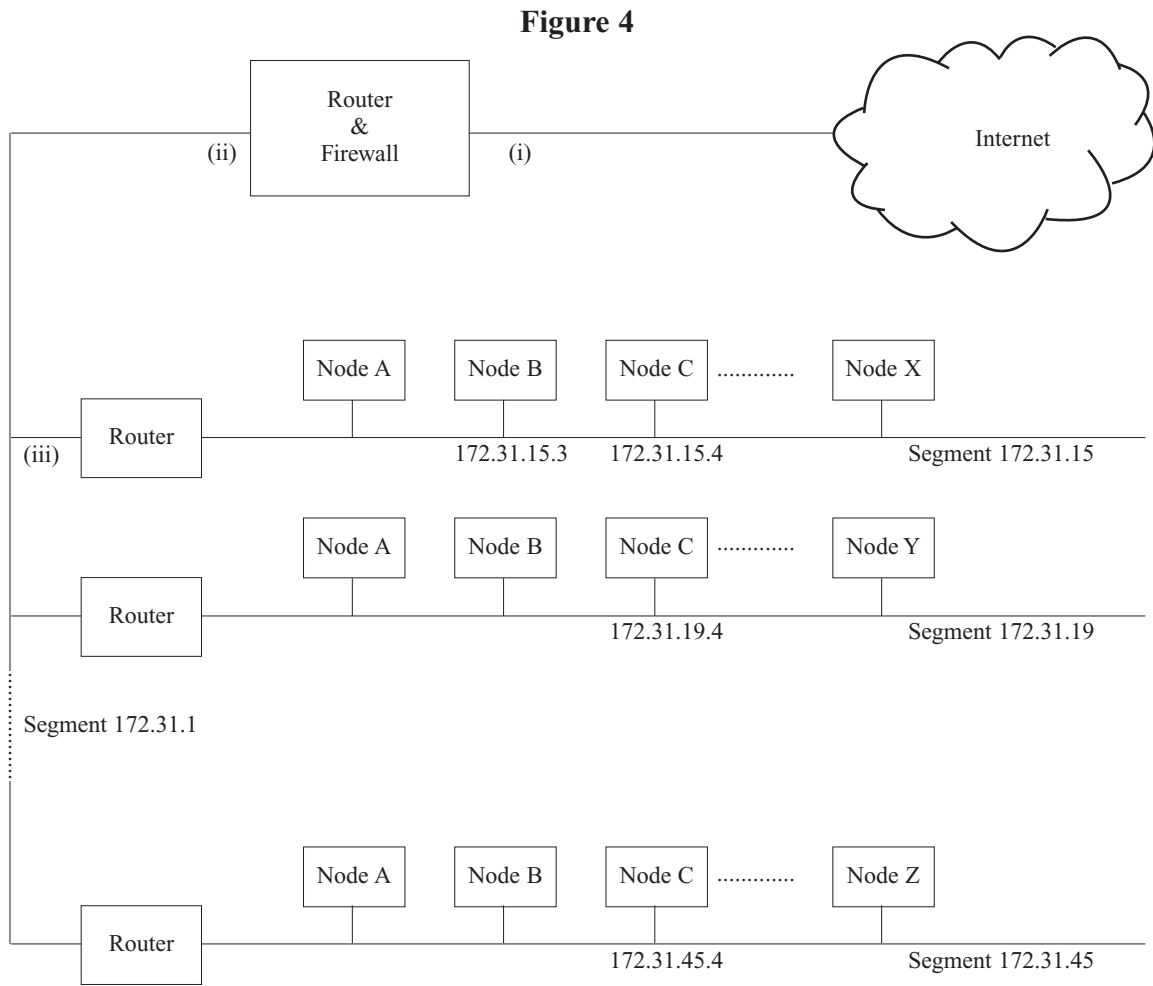
(3 marks)

3

Turn over ►



- 6 The head office of an organisation consists of several large offices, each with many computers linked as a local area network (LAN). The LAN also links to the Internet via a router and firewall. In each office, the computers are linked as a segment as shown in **Figure 4**.



- (a) IP addresses that begin with 172.31 are non-routable addresses. Why are these used within the LAN?

.....

 (1 mark)

- (b) The network manager has registered IP address 212.99.34.23 with the Internet registrar.

Referring to **Figure 4**, write suitable IP addresses for

- (i)
- (ii)
- (iii)
- (3 marks)



(c) Give **two** reasons for segmenting this LAN.

1

.....

2

.....

(2 marks)

(d) (i) What would be a suitable subnet mask for this LAN?

.....

(1 mark)

(ii) Using addresses 172.31.15.3 and 172.31.19.5 explain how a subnet mask is used to determine whether the computers are on the same subnet.

.....

.....

.....

.....

.....

(3 marks)

10

END OF QUESTIONS



There are no questions printed on this page

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