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RECOGNISING ACHIEVEMENT

ADVANCED GCE

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

G054/IC

Software Development

INSTRUCTIONS FOR CANDIDATES

Thursday 23 June 2011
Morning

Duration: 1 hour 30 minutes

OCE/35808

INFORMATION FOR CANDIDATES

- This document consists of **8** pages. Any blank pages are indicated.

INSTRUCTION TO EXAMS OFFICER / INVIGILATOR

- Do not send this insert for marking; it should be retained in the centre or destroyed.

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PRE-RELEASE TASKS – INSTRUCTIONS FOR CANDIDATES

Read the attached case study and these instructions carefully, then carry out the tasks detailed below. There are two types of task.

In Task 1 you will produce notes that will help you to answer questions in the examination for this unit. The other tasks will be marked and will contribute up to 30 of the 100 marks available for this unit.

You will need your completed tasks when you take the examination for this unit.

Make sure that your name and Centre number are on each page.

When you have completed the tasks you must sign and date a Candidate Authentication Statement. You must then ask your teacher to sign to confirm that the work is your own.

Task 1

Produce the following for A Clean House

- a feasibility study
- investigation methods
- maintenance and security recommendations including legislation implications
- details of end user documentation

Task 2

Develop a rich picture diagram for the current system in use at the head office (see Appendix 1). The process starts when a customer contacts A Clean House to organise a regular cleaning appointment and ends when the receipt is sent to the customer.

Briefly evaluate the methods you used to develop this rich picture diagram. **[15]**

Task 3

Develop an Entity Relationship Diagram (ERD) for the proposed system, including the identification of Primary and Foreign Keys (refer to Appendix 2). **[10]**

Task 4

Design a user interface for the Cleaning Manager. **[5]**

A Clean House

A Clean House is a small independent business based in Peterborough. The main function of the business is to provide cleaning services of their customers' homes. Customers make appointments with the business for their houses to be cleaned.

The head office of A Clean House is located in the centre of Peterborough. The owner of A Clean House is based here, as are two administration staff.

The cleaning materials, such as carpet cleaners, mops and buckets, are stored in a purpose built secure warehouse on a site about 5 miles away from the head office. In this warehouse there is another office used by cleaning staff. The vans, used by the cleaning staff, are also stored on this site. The cleaning supplies and equipment for the appointments are put onto the correct van each morning.

The price of the cleaning service offered by A Clean House is based on the number of bedrooms in the house being cleaned. These prices are shown in Table 1.

Number of bedrooms	Price
2	£50
3	£60
4	£70
5	£80

Table 1

If the number of bedrooms is greater than 5 then the price increases by £15 for every extra bedroom.

A Clean House can also provide additional services such as ironing, cleaning of ovens and cookers and carpet and curtain cleaning. The prices of these are shown in Table 2.

Service	Price
Cleaning of ovens and cookers	£20.00
Carpet cleaning per room	£25.00
Ironing	£25.00
Curtain cleaning per room	£30.00

Table 2

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If a number of additional services are required for one house, then the total price is reduced. The reductions are shown in Table 3.

Number of services	Reduction
1	0
2	£10.00
3	£15.00
4 or more	£25.00

Table 3

Most of the customers of A Clean House have regular appointments, but A Clean House can also provide cleaning services as a one-off appointment for example if a customer is moving house. Regular customers can arrange any change to their cleaning services and others can book one-off appointments by visiting, emailing or telephoning the head office.

At the moment all communication between the head office and the warehouse site is by phone or by a member of staff delivering the information by hand. This information may be on paper or on electronic media.

A Clean House currently has four desktop computers. Three of the desktop computers are used in the head office. One of these is in the owner's office and is used for keeping staff personnel records and other private company information. The other two are used by the administration staff and one of these computers (the appointment system) is used to:

- keep records of all appointments and any additional services required
- print out the invoices that are given to customers
- keep records of which cleaners are available

Once appointments have been taken from customers, the details of the appointment are passed to the warehouse. The Cleaning Manager records the appointment details into a book where any special cleaning materials required are also detailed. If the appointment is a one-off then the Cleaning Manager notifies the administration staff who create and send an invoice for the cleaning services carried out.

The third computer is used to record payments from customers and to suppliers. Customers who have a regular appointment are sent an invoice at the end of each month detailing the dates, service carried out and the total cost. Currently all calculations are completed manually as word processing software is used to create the invoices. When the payment is received from the customer it is recorded on a spreadsheet. A receipt showing full and final payment is then produced and posted to the customer. Payments to suppliers are also recorded on this computer.

None of the computers based in head office has any form of security, leaving the information stored on them open to misuse.

These three computers were purchased recently and the owner would like to keep them as part of the new system. The computers use a standard windows operating system with an office suite. The owner would like to retain this software.

The fourth computer is in the warehouse office, and is used by the Cleaning Manager. This computer is supposed to be used to keep records about the customer appointments and the cleaning services required. The customer appointments, the cleaning supplies needed for each day and the cleaners allocated, are initially kept manually and transferred to the computer each afternoon when the next day's appointments have to be dealt with and scheduled. The stock levels of the cleaning supplies should also be checked each afternoon, when the cleaners return to the warehouse. This very rarely happens as the Cleaning Manager is too busy. This means that when the Cleaning Manager notifies the administration staff of the stock that needs re-ordering, the orders are not always accurate. This has, on occasions; led to cleaners arriving at customers' houses without the correct cleaning materials, so the jobs cannot be completed.

There have been instances in the past when vans and cleaners have arrived at the wrong location on the wrong day, leading to customer dissatisfaction. There are also other problems that need to be solved. The main ones are:

- vans arriving at regular customers' houses when the customers have cancelled
- invoices not being given to customers resulting in loss of revenue for A Clean House
- changes to regular customer appointments, such as a change in the service required, not being actioned.

In addition, there are other problems that need to be solved by the new system. These include incorrect stock records being held. This means that incorrect stock orders are being sent to suppliers. On occasions, additional urgent telephone orders are being made to suppliers. On occasions the cleaning materials required are out of stock at the suppliers, so the order cannot be filled. Supplier details are manually stored at A Clean House so stock orders have been sent to the wrong supplier, this has lead to a delay in getting the stock required. The owner has asked that these supplier records be transferred to a computerised system.

The owner wants to modernise the business and the working practices. There is concern about the poor security of the information currently on the computers. The other concern is that the computer at the warehouse does not have internet access. The owner has asked that the new system has full Internet access with email communication, both internal to the business and externally. This will, it is hoped, speed up communication between the warehouse and the head office.

The new system should also be able to produce the following reports:

- the total number of each service completed (ironing, cleaning of ovens and cookers, cleaning of carpets and cleaning of curtains) on a weekly basis
- the amount of revenue that each service brings to the business
- the number of houses cleaned each week, including a breakdown of the number of houses for each number of bedrooms, as shown in Table 1.

The system should also be able to keep records of all the customers who use or have recently used A Clean House. Invoices should be created using appropriate software to ensure that all calculations are completed automatically by the software.

The owner has also asked that the operating system and applications software, used throughout the company, be standardised. At present different versions are used at the head office and warehouse. This has proved to be a problem when information and data has to be shared. The owner is, however, concerned about the security of information and data that would need to be shared.

The Cleaning Manager, who will be using the new system, has asked that the stock system shows the re-order levels of each stock item and that a daily automatically generated report should also be sent to the head office, showing which items of stock need to be re-ordered.

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As the Cleaning Manager has limited ICT skills, they have asked that the user interface of the stock system be user friendly with helpful user messages. They have also asked that user errors be limited through the automatic facilities of the system.

The administration staff have asked that customer details be accessible through the use of a unique customer number. Details of appointments, invoice numbers and payments made will also need to be recorded and updated automatically.

The owner has asked that head office have a total of four computers, which must be linked, and the warehouse have two, these should also be linked. They have asked that the existing computers, in the head office and the warehouse, be incorporated into the new system. Each computer should be connected to a black and white printer.

As the staff are familiar with the operating system and applications software that are currently used on the computers in A Clean House, they have requested, with the agreement of the owner, that the vendors of these be the same in the new system. The staff do, however, appreciate that upgrades may be required.

The owner would also like to have a net book so she can work away from the office accessing data and information remotely. When she is working in the head office the net book must be capable of linking to the other computers to share information and files with the rest of the business.

The owner is considering expanding the business in the future to provide cleaning services to offices. It is essential that the new system be able to cope with this change and also be able to be adapted for any other changes which may have an impact on cleaning charges, such as:

- changes in VAT
- changes in prices for cleaning materials
- increase in wage rates for the cleaners
- the vans running costs.

It is hoped that the new computer system will meet all these requirements and solve the problems with the current system. The owner has allocated a budget of £20,500 for the hardware, software and installation costs.

The new system must be implemented over a weekend so that disruption is kept to a minimum.

Appendix 1

When a customer books an appointment the following procedures take place within A Clean House.

- The customer advises a member of the administration staff of the start date, frequency of appointment, location and service(s) required.
- A member of the administration staff enters these details onto the appointment system.
- The information about the appointment is sent to the warehouse.
- In the warehouse office, a record of the appointment details is made by hand.
- The cleaning services are completed.
- If the appointment is a one-off, when the appointment has been completed details are sent to the administration office. If the customer has a regular appointment, details are sent once a month.
- An invoice is created.
- The invoice is sent to the customer.
- The customer pays the balance.
- Details of the payment is recorded by the administration staff onto the accounts system.
- A receipt showing full and final payment is posted to the customer.

Customers can also request an invoice at any time to bring their account up-to-date.

Appendix 2

The following **entities** could be used when developing the new system. You **will** need to amend the entities given and add new entities to design a working system.

APPOINTMENT (**Appointment_Number**, *Cust_ID*, start_date, frequency, *Service_Number*)
CUSTOMER (**Cust_ID**, address, contact_number,)
SERVICE (**Service_Number**, cost)
STAFF (**Staff_Number**, staff_name)

<u>Key</u>

Primary Keys are in **bold**
Foreign Keys are in *italics*

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