Task:
Design a database to be used by a second hand car dealer to keep electronic records of the cars he has in stock.

Analysis

The Analysis Section is worth 9 marks. It is broken down into three sections, with each section worth 3 marks.

Identify a Problem

What is meant by a problem?

It is very important that you understand what is meant by a problem – the project hinges on a good understanding of the problem and the solution. There are 3 marks for this part.

A problem is a task that cannot currently be done, or a task that takes a long time and is difficult to do. For example, searching for cars that fit a certain requirement, such any car costing less than £3000 or all cars with electronic windows and central locking, can be done using paper-based card index files. However, it is awkward and very time consuming (particularly if you have hundreds of cars) so it is a problem and can be solved using a computer (in this instance by having a database of cars).

The problem does not have to be complex – it can be very simple.

The identification of the problem has four parts

- Problem:
- Why is it a problem:
- Solution:
- Software used:

Problem: This is a simple statement of the problem. A simple sentence stating what the problem is.

> *For example: The problem is that it is not easy to search for cars using a manual card based system*

Why is it a problem: This is where you need to add detail to the problem – rather than just saying that it is a problem, you need to give some reasons showing why it is a problem. For example, if the problem is that car records cannot be found easily other than by the first Field name, the reasons it is a problem is:

> *When a customer asks for the details of a type of vehicle they may want in a paper based record system the cards have been stored in alphabetical order of the Make of the car (eg Ford will be before Vauxhall). If the customer wants to look at all Vauxhalls then that is not a problem but if he wants those that cost less than £3000 all the cards with FORD on will have to be looked at. Worse if the customer asks for any car costing less then £3000 the owner will have to look at all the cards one after*

the other. This is very time-consuming and easy to miss some cars.

Solution: This is a statement about what the solution to the problem will be. It needs to contain some information about what details will be held, what searches etc.

For example, the details of all the vehicles in stock need to be held on a database. It will hold information on their Make Model Colour Registration, Mileage etc. Data can be sorted and a search can be done on one or more fields

Software used: This is a simple statement saying what software you are going to use:

To solve the problem I will use a database and the one I am going to use is Microsoft Excel

Use Methods of Collecting Information

This section is about collecting information from the potential users of the system. There are 3 marks available for this section

Potential users are the people who will be using the system that you are creating.

What information do I need from them?
The potential user will need to be asked questions to do with the new system. The questions need to cover three main areas:

1. What information is stored?
2. What searches are done on the data?
3. What output (reports/letters) are required?

What information is stored?

You need to find out the exact data that is stored by the potential user. For example, in a second hand car showroom, it would be the make, model, number of doors, colour, mileage, engine size, price, etc.

What searches/calculations are done on the data?

You need to find out what happens to the data that is collected. For example, in a second hand car showroom the searches might be – find cars under a certain price and mileage, to find blue ford cars, and so on.

What output (reports/letters) are required?

This is a list of the "output" requirements – what does the potential user need to get out of the system. For example, in a second hand car showroom the outputs might be a list of all cars in stock, or answers to customer queries about certain makes or models or specific accessories like Alloys or Central Locking

Collecting the Information
There is more than one method of collecting information from the potential users. You need to look at **three** different methods of collecting information. For each method you need to look at the advantages and disadvantages of each method. You need to end up making a decision as to which one you are going to use.

The main methods that you have of collecting information are:

- Interview

- Questionnaire
- Observation

Each method has its advantages and disadvantages – an interview requires time, a questionnaire might not be truthful, with observation you might not get to see what you need to see.

Use this template in the writing frame document to help you.

Method of Collecting Data	Advantages	Disadvantages
Interview		
Questionnaire		
Observation		

Once you have filled in the advantages and disadvantages of each method you must write a paragraph about the one that you are going to use giving the reasons for your choice. This may be a repetition of the advantages.

Use the document Researching Your Project to help you do a survey of three car sales staff at your chosen garage.

Identify the inputs, outputs and processing required

There are 3 marks available for this section. The marks are for describing the inputs, outputs and processing required by the current system – not the new system and suggesting a system specification to solve the problem

What are inputs, outputs and processing?

Inputs

These are anything that is put into the system. Inputs are most likely to be pieces of information. For example, with a second hand car dealership, the inputs will be all the information about a car.

Outputs

These are what comes out of the system – it could be letters, reports, graphs, etc. The outputs will be specific information. For example, in the second hand car dealership, one of the outputs will be information for customers about specific vehicles they are interested in.

Processing

This is what happens – actions within the system. For example, searching to find a vehicle costing less than £5000 would be – go to the filing cabinet find the all the record cards. Start with the first record and go through each record individually finding all those that cost less than £5000. Take them out of the records, photocopy the details and then put them back in their correct order in the filing cabinet The processing is searching and sorting

System Specification

For the final marks in this section you need to look at system specifications.

A systems specification is a list of hardware and software that you will use to solve the problem. You do not need to mention specific details (such as software names) – general types of software is all that is required.

The hardware specification needs to consider:

- Processor
- RAM
- Hard Disk Capacity
- Monitor Size
- Printer
- Internet connection(?)
- Network connection (?)
- Graphics
- Sound
- Addition – scanner, graphics tablet, etc.

The software specification is about listing different types of programs that could be used. For example, I need to use the search facility in the database but I could sort data in a spreadsheet or a word document

Design

The design is worth 6 marks. This is the section where you produce designs for three parts of the new system – the data structures and the user interface and specify some actual hardware and software to use.

The design is broken down into 4 sections.

1. Produce designs for the data structure
2. Produce designs for the user interface
3. Produce software and hardware requirements

Produce designs for the data structure

The data structure is how the data used in the system is to be stored. For a database this is the design of the tables that hold the data

The database design needs to include the following:

Field Name	Type	Validation

- **Field Name:** A name that identifies the data entered.
- **Type:** The type of character that will be entered into the field - Text (string), Integer, Boolean, Choice, Autonumber, Real, etc.
- **Validation rules:** How you will stop unrealistic information being entered – range, type, length, etc.

Field Name	Type	Validation
Make	Text	Drop down list
Model	Text	None
Doors	Integer	Range
Mileage	Integer	Range

You need to show 3 alternative designs to gain the marks in this section. This should be done by hand with only the best design being used to implement your database.

Produce designs for the user interface

The user interface is a screen or form where the potential user interacts with the computer system. In a database it is the form they use to enter data.

You need to design the screen/form/letter – a hand drawn design is the best thing to do. The design should show what fonts and font sizes as well as any colours used

Again you need to design 3 alternatives.

Produce software and hardware requirements

This is almost a repetition of what you have done for the analysis section: **Identify the inputs, outputs and processing required,** with a little more detail being added.

You need to copy and paste what you have written for the earlier section and make sure that it appears twice – and then add some more detail to it here.

One difference is that whereas before you were talking about the software in general terms – word processor, database, etc, this time you can mention brand names – Word, Access, etc.

The other difference is the amount of software – you need to consider the operating system and any other software – compression software, e-mail etc.

You need to come up with three hardware specifications and three different software packages that you could use.

Implementation

The implementation is worth 7 marks. This is the section where you create the database.

The implementation is broken down into 3 sections:

1. Implement their data structure
2. Implement their form and output formats
3. Use features of software appropriately

Implement their Data Structure

You need to produce a guide, which anyone can follow, detailing how you created the data structure. The idea of the guide is that someone who can use the computer can follow the guide and recreate the database.

The guide should contain text and screenshots of the creation.

Implement their Input and Output Formats

You need to produce a guide, which anyone can follow, detailing how you created the user screens (input). The idea of the guide is that someone who can use the computer can follow the guide and recreate the database/spreadsheet etc.

The guide should contain text and screenshots of the creation of the forms and the input screens.

You also need to identify any changes that you made to your Data Table structure such as Coding or abbreviating field names or validation rules added.

Use Features of Software Appropriately

This is a section that does not need you to write about it separately from the rest of your project.

This does not mean that you can just ignore it! The marks for this section are found by your teacher looking through the rest of your project. If they cannot find the evidence then you will not get the marks.

They will be looking for sorting and searching and graphing which must happen as part of the testing of your database.

Testing

The testing section is worth 6 marks. This is the section where you provide evidence that what you have created in the previous section actually works.

The implementation is broken down into two sections:

1. Describe their testing
2. Describe their results

Ideally the two testing sections should be done together as a single unit rather than as two separate parts. Although the two are separated below, at the bottom of this section there is an indication of how you can put the two together.

Describe their Testing/Results Together

It is possible to put the two testing sections together and to look at the as a single task.

Use the Test Plan in the VDrive as a guide and complete at least 8 tests of your data. This should include a sort, 5 searches and 2 validation rules tests.

Evaluation

This is the final section. There are 3 marks for the evaluation.

At the beginning of the project you set a problem. This is the point where you go back and see what you have done to solve the problem.

You need to list the problem and the user requirements (what you need to do to solve the problem) and against each one write a description of whether you have completed it or not and give some evidence (screenshots) to show that you have done it.

In the design section, you designed the data structure and user interface. You need to compare what you designed with what you created and write a paragraph saying if you achieved what you designed. Some screenshots may help.

In addition for the final marks you describe what your system could not do and what you could do to put it right.

Total marks available 31.