

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Education
June 2004
Advanced Subsidiary Examination



COMPUTING

Unit 3 Practical Systems Development

CPT3

Monday 17 May 2004 Afternoon Session

In addition to this paper you will require:
your completed Practical Exercise for CPT3
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 in the spaces provided. All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 65.
- Mark allocations are shown in brackets.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate.
- The degree of legibility of your handwriting and the level of accuracy of your spelling, punctuation and grammar will also be taken into account.

At the end of the examination

- Hand in **both** this question paper **and** your Practical Exercise documentation to the invigilator.
- **Warning:** If you do not hand in both documents it may not be possible to issue a result for this unit.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
9			
Total (Column 1)		→	
Total (Column 2)		→	
TOTAL			
Examiner's Initials			

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

Answer this paper using the documentation you have prepared for the Tod's Tyres practical exercise as requested in the 2004 specification. A copy of the brief for this practical exercise has been included at the end of this paper if you need to refer to it.

Many of these questions require you to give the page number in your documentation, where the evidence for the answer may be found. You should write the number of the question in the margin of that page in your documentation.

At the end of this examination your documentation **must** be handed in with this question paper.

1 This question relates to the DESIGN process.

(a) Give the page reference where the data items relating to the individual cars are defined.

Page

(1 mark)

(Write Q 1(a) in the margin, in the correct place, on that page.)

(b) For **each** of the following data items, give the data type used and the field length allocated in your solution.

	Data Type	Field length
i. car registration number		
ii. number of tyres		
iii. telephone number		

(6 marks)

(c) Explain your choice of data type for **each** of these three data items.

(i) car registration number;

.....

.....

(1 mark)

(ii) number of tyres;

.....

.....

(1 mark)

(iii) telephone number.

.....

.....

(1 mark)

2 This question relates to the DESIGN process.

(a) Using the format

Table Name(Primary Key, Attribute1, Attribute2,...)

describe **each** of the following:

(i) company details;

.....
.....

(ii) car details;

.....
.....

(iii) tyres;

.....
.....

(iv) the fitting of new tyres.

.....
.....

(8 marks)

(b) In setting up these records you could have used a *foreign key* and a *composite key*. Define **each** of these two terms. (You may use an example from your solution.)

(i) foreign key;

.....

(2 marks)

(ii) composite key.

.....

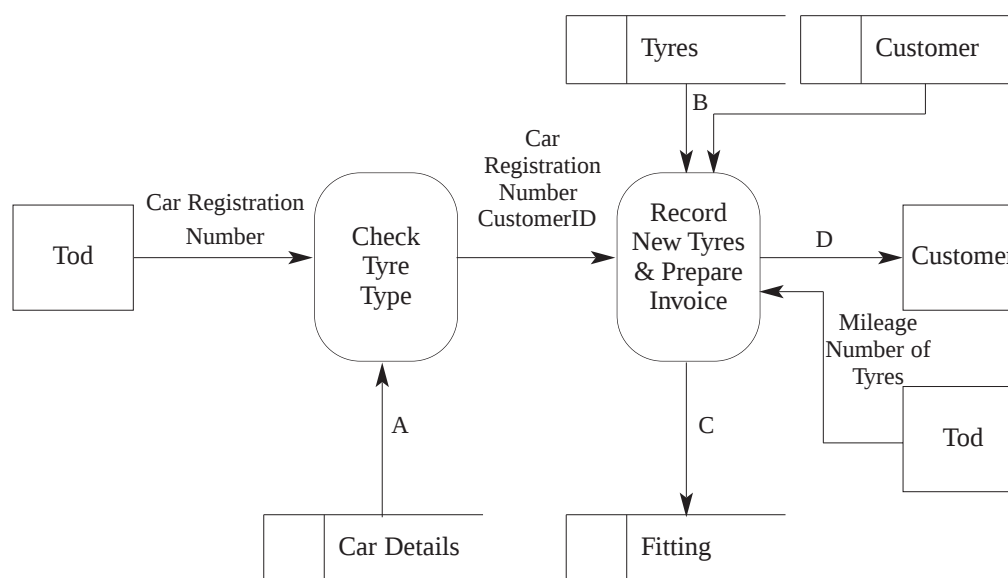
(2 marks)

12

Turn over ►

3 This question relates to the DESIGN process.

Complete the data flow diagram for that part of this system shown below by providing labels for **each** of the data flows A, B, C and D.



- A
- B
- C
- D

(4 marks)

4

4 This question relates to the IMPLEMENTATION process.

- (a) (i) Give a page reference showing that your solution selects some customers for a discount.

Page

(1 mark)

(Write Q 4(a) in the margin, in the correct place, on that page.)

- (ii) How does your solution select those customers?

.....

.....

.....

(2 marks)

- (b) (i) Give the page reference showing the coding for the calculations that are used to produce an invoice.

Page

(1 mark)

(Write Q 4(b) in the margin, in the correct place, on that page.)

- (ii) Explain how an invoice is calculated. Your explanation must include both customers with a discount and those without.

.....

.....

.....

.....

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.....

.....

.....

(4 marks)

- (c) (i) Give a page reference of a hard copy of an invoice.

Page

(1 mark)

(Write Q 4(c) in the margin, in the correct place, on that page.)

- (ii) How do you ensure there are two identical copies of an invoice?

.....

.....

(1 mark)

10

TURN OVER FOR THE NEXT QUESTION

Turn over ►

5 This question relates to the TESTING process.

- (a) (i) Give the page reference showing evidence of the validation of a car registration number.

Page

(1 mark)

(Write Q 5(a) in the margin, in the correct place, on that page.)

- (ii) Explain how your solution performs this validation and what action has to be taken if the car registration is not valid.

Explanation

.....

Action

(2 marks)

- (b) (i) Give the page number of your test plan showing the testing of the number of tyres provided for a vehicle at any one time.

Page

(1 mark)

(Write Q 5(b) in the margin, in the correct place, on that page.)

- (ii) From this part of your test plan, give **one** example of a boundary or extreme test value.

.....

(1 mark)

- (iii) From this part of your test plan, give **one** example of an erroneous test value.

.....

(1 mark)

- (c) (i) Give a page reference showing evidence of a test carried out on the accuracy of the calculations for an invoice.

Page

(1 mark)

(Write Q 5(c) in the margin, in the correct place, on that page.)

- (ii) Explain how this test is carried out in your solution.

.....

.....

.....

(2 marks)

6 This question relates to the OUTPUT process.

What processing steps would be followed to identify those cars that might be due for new tyres, and to notify the relevant customers with a quote? List **five** processing steps. (You were **not** asked to implement all these processing steps in your solution.)

- 1
-
- 2
-
- 3
-
- 4
-
- 5
-

(5 marks)

7 This question relates to the further development of your solution.

Tod asks you to set up a *template* for his business letters.

(a) What is a template?

-
-
-

(2 marks)

(b) Suggest **three** layout features of the letter that could be set for a template.

- 1
- 2
- 3

(3 marks)

Turn over ►

8 This question relates to the IMPLEMENTATION process.

After you have prepared and tested your solution, Tod sees it running on your computer and then approves it. You copy the software onto CD-R. Give **four** steps that still have to be followed before Tod and his employees can start using the software.

- 1
-
- 2
-
- 3
-
- 4
-

(4 marks)

9 (a) Give **two** extra items Tod would need to be able to use the Internet.

- 1
- 2

(2 marks)

(b) Give **two** advantages to Tod's Tyres of using e-mail to communicate with customers.

- 1
-
- 2
-

(2 marks)

(c) How else might Tod's Tyres use electronic communication? Give **one** further example, showing the proposed benefit.

Example

Benefit

.....

(2 marks)

END OF QUESTIONS

This question paper has been based on The Practical Exercise – Tod's Tyres – which was given in the 2004 specification. A copy of this exercise is given below for reference purposes only.

AS Practical Exercise

(CPT3) – Tod's Tyres

Background

Tod's Tyres is a small business which supplies new car tyres to company car fleets and car hire firms.

You have been asked to create a computer application, **either programmed or using a database**, to replace the current manual record-keeping system. Initially, at least, there will be only one stand-alone workstation with a printer attached. This is to be kept locked in the office.

For the purposes of this exercise, you may assume that all the cars have the post-2001 format car registration number. Eg AB 03 XYZ

Specification

1. When a car is brought to Tod for the first time, the following information is recorded on a card: car registration number, company name, type of tyre fitted. Each time that car has new tyres the date, car mileage, and number of new tyres fitted is recorded on the card. There is also a space to make a comment; for example, the mechanic fitting the tyres may have noted some other problem with the car, which they would bring to the notice of the customer so that it could be sorted out. When a card becomes full, a new card is stapled to the original one. These cards are filed in car registration number order.
2. The next time the company books in a recorded car for new tyres, Tod checks the card file to see what type of tyre that car has fitted. He then ensures that he has the required tyres in stock. He prides himself that he never lets a regular customer down.
3. Tod gets his tyres from one supplier only. This supplier sends him an up-to-date supplier price list once a month. Tod then adds his fitting costs to produce a customer price list. The current price list is as follows.

Turn over ►

Type	Manufacturer's Code	Customer's Price (Ex VAT)
155/80S13	P1000	£36.00
165/80S13	P3000	£39.00
155/80S14	P5000	£58.50
165/80S14	P7000	£64.00

4. Some companies are allowed a 5% discount before VAT is added. At present, Tod does not keep a record of who these are because he can remember them. However, a computerised system would have to keep a record.
5. VAT is payable at the current rate.
6. Tod keeps company details, (Company name, contact name, address, post code and telephone number), in another card file.
7. Tod supplies an invoice to his customers. This invoice is supplied in duplicate, one copy for the customer and one for Tod's own records for his accountant. It has an invoice number in the top right hand corner. It details the date, the company name, post code and telephone number, the car registration number, the number of tyres supplied with their price, the discount where applicable and the VAT.
8. Once a month, one of the clerks goes through the cards and pulls out cards for cars which last had new tyres over a year ago and so might be ready for new tyres. Tod then sends the customer a standard letter reminding them that the tyres are ready for replacement, and quoting them a price.
9. Tod also intends to use a popular word processing package. He wants to use the Internet and e-mail in the near future, and possibly have his own Web site. He feels that a move into electronic communication would be beneficial to his business. You should bear these plans in mind when designing your system, although you are **not** expected to incorporate these applications for this exercise.

Testing

Car registration numbers should be validated and the number of tyres sold for one vehicle at any one time should not exceed 5. Testing should ensure that the calculations produce the correct result.

Requirements of the Practical Exercise

Candidates will need to design and implement an appropriate computing system and provide sufficient documentation to demonstrate the following practical skills.

- Design
- Implement/Test. For the purpose of this exercise, the actual implementation of the sending of the standard letter to customers (paragraph 8 in 19.4 above) is **not** required, although thought should be given as to how this would be implemented.

The task may be undertaken by:

either writing a program in a chosen high level language

or using a suitable application package.

Candidates are expected to produce brief documentation including some or all of the following, as appropriate.

Design

- Definition of data requirements
- User interface design including output, forms and reports
- Method of data entry, including validation
- Record structure, file organisation and processing
- Security and integrity of data
- System design

Implementation/Testing

- Details of test plan with explanation, and evidence of testing having been carried out
- Hard copy output of the invoice, with and without discount
- Hard copy of solution e.g. annotated program listing/database tables, forms and reports.

This documentation is to be brought to the examination and handed in with the candidate's answer script for Unit 3 (CPT3) at the end of the examination. A Cover Sheet, signed by the teacher and the candidate, authenticating the work of the candidate, must be attached to the documentation.

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE