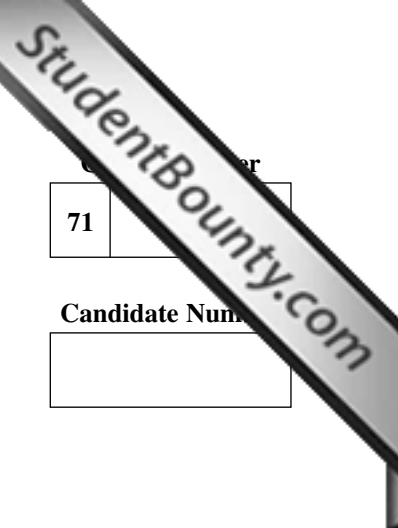




Rewarding Learning

ADVANCED
General Certificate of Education
January 2009



71

Candidate Number

Applied Information and Communication Technology

Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]



MONDAY 12 JANUARY, AFTERNOON

TIME

2 hours.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Answer **all eleven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 100.
Quality of written communication will be assessed in all questions.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
This paper is accompanied by a Case Study. You must **not** use your own annotated copy of this Case Study.

ADVICE TO CANDIDATES

You are advised to take account of the marks for each part question in allocating the available examination time.

For Examiner's use only			
Question	Marks available	Marks	Remark
1	5		
2	11		
3	12		
4	8		
5	13		
6	14		
7	14		
8	9		
9	6		
10	4		
11	4		
Total	100		

1 Following several meetings with consultancy firms, Janet has decided to employ DYNAMIC DESIGNS to coordinate the development process. Chris Smith, the senior systems analyst with DYNAMIC DESIGNS, has identified several problems with the existing system. He has explained to Janet Legg that it is very important to understand the effect that each of these problems is having on the company.

Five of the problems Chris has identified are listed below. Provide one reason why each of these problems will have an effect on the business. Write your answer in the space provided.

	Problem	Effect on the business
1	Staff are sometimes off sick.	
2	Lots of paperwork needs to be kept up to date.	
3	The secretary must remember to allocate an extra 15 minutes for a new client.	
4	A product being out of stock is only identified when a customer asks for a particular item.	
5	The secretary finds the whole process very tedious and time consuming.	

[5]

2 Chris Smith knows that background information about the current situation at TIP TOP TOES is needed. He has asked a junior analyst, Peter O’Kane, to plan the fact finding activities.

(a) Complete the following table to identify the fact finding technique being used in each situation.

SITUATION	TECHNIQUE BEING USED
Talk to Janet Legg to get an overview of the whole business.	
Spend some time sitting in the reception area.	
Examine some of the client files.	
Find out how all customers feel about TIP TOP TOES.	
Find out what therapists find difficult about the current procedures.	
General chat about work with staff in the staff room.	

[6]

Before he starts the fact finding activities, Chris gives Peter some advice.

(b) Complete the table below by stating whether each statement is either **True** or **False**.

Interviews are the easiest method of fact finding as you don’t have to plan anything beforehand.	
Questionnaires are useless as people never fill them in honestly.	
Document research is very useful as it provides you with reference material.	
With observation, you must ensure that the person understands why you are watching them.	
Fact finding is the least important part of the system development life cycle.	

[5]

3 Early on in the process, Chris has a meeting with Janet to discuss certain documents which will be produced during the computerisation project.

(a) Complete the table below, by entering a number in the sequence column, to show the order in which the documents should be produced.

Document	Sequence
System Specification	
Feasibility Study	
Project Plan	2
Technical Guide	
Test Plan	
User Guide	6

[4]

(b) Why is a feasibility study written for the project at TIP TOP TOES?

[1]

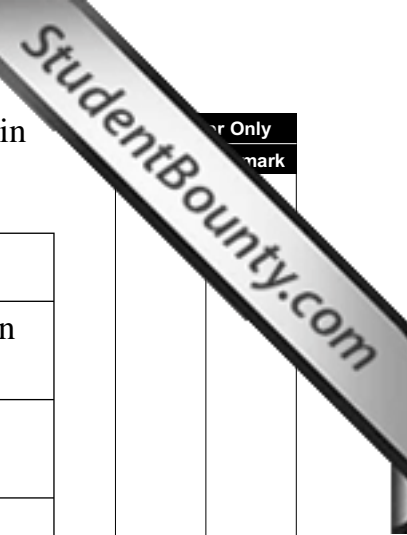
(c) Why is a system specification written for the project at TIP TOP TOES?

[1]

(d) Identify with a tick (✓), **one** section which should be included within each of the listed documents.

	DOCUMENTS			
Section	System Specification	Feasibility Study	Technical Guide	Test Plan
Algorithms				
Installing a new printer				
User requirements				
Cost benefit analysis				
Proposed screen layouts				
Data files				

[6]



For Only
mark

4 On completion of his investigation activities, the junior analyst has identified the following requirements for the new system at TIP TOP TOES.

He now needs to categorise them into inputs, outputs, files and processes. Complete the following table by inserting a tick (✓) to show which category each item should be assigned to:

	Categories			
	INPUT	OUTPUT	FILE	PROCESS
Produce client invoice				
Therapist rota				
Client name				
Payments				
Update client address				
Calculate weekly sales figures				
Stock				
Appointment card				

[8]

5 Chris has decided that a database approach would be the best way of meeting all the identified requirements within TIP TOP TOES.

(a) Give **two** advantages of using a database within TIP TOP TOES.

Advantage 1

[1]

Advantage 2

[1]

Following discussions with Janet, the analyst has decided that details about the range of treatments available should be stored within the system.

(b) Identify with a tick (✓) which three of the following data items should be stored in the **TREATMENT** table.

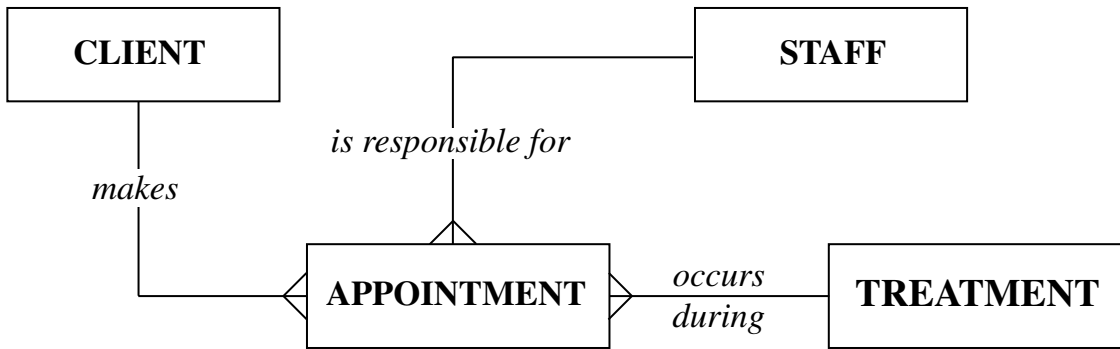
Description	
Staff ID	
Date	
Duration	
Room	
Cost	

[3]

(c) A primary key is needed to uniquely identify each record within the **TREATMENT** table. Suggest an additional field that could be used for this purpose.

[1]

The proposed structure for the new database is as shown below:



Peter needs to look closely at output requirements. Janet wants to be able to produce appointment confirmation cards to give to clients when they book an appointment.

The proposed layout is shown below.

Jenny Black 25 Hillards Mount Bangor	TIP TOP TOES Appointment Details	Appt No: 10091
Date:	2 July 2009	
Time:	10.30 am	
Treatment:	Pedicure (including foot massage)	Cost: £19.00
Therapist:	Jill	
Cancellation will only be accepted up to 24 hours before an appointment, otherwise there will be a £10 charge.		
25 Long Road, Bangor. Tel: 028 76543214		

(d) The data necessary to produce this output can be found in the following tables. Identify with a tick (✓) which fields could come from which tables.

	Tables			
	CLIENT	APPOINTMENT	TREATMENT	STAFF
Client Name				
Appt No				
Date				
Time				
Treatment Type				
Cost				
Therapist Name				

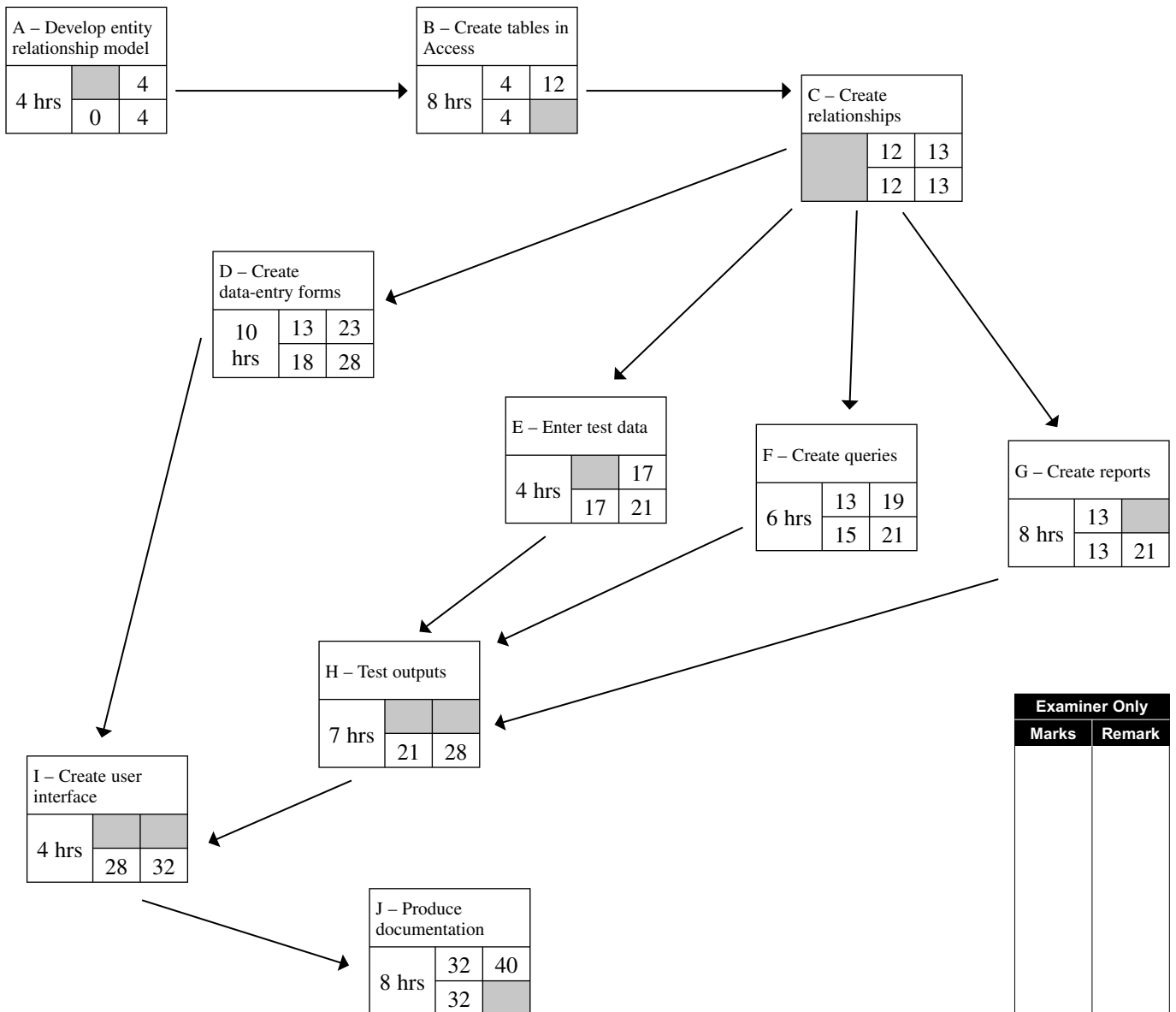
[7]

Examiner Only	
Marks	Remark

6 Chris has produced a plan to show how long the database development will take

Activity	Description	Predecessor	Duration
A	Develop entity relationship model	None	4
B	Create tables in Access	A	8
C	Create relationships	B	1
D	Create data-entry forms	C	10
E	Enter test data	C	4
F	Create queries	C	6
G	Create reports	C	8
H	Test outputs	E, F, G	7
I	Create user interface	D, H	4
J	Produce documentation	I	8

(a) Using the table above, complete the following network diagram:



Examiner Only	
Marks	Remark

[10]

(b) What is the shortest time for completion of this project?

_____ [1]

(c) Identify one area of float within the project plan.

_____ [1]

(d) List those activities on the critical path.

_____ [2]

7 Jemima Shields is the developer who has been assigned to work alongside Chris on the project. She has asked for a series of data models to be developed.

(a) Name **two** diagrams which should be included.

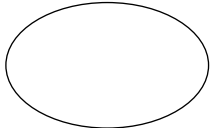
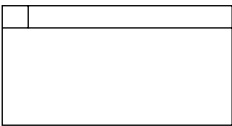
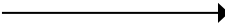

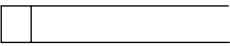
Diagram 1

_____ [1]

Diagram 2

_____ [1]

(b) Complete the following table to explain the notation used within data modelling:

Symbol	Description	Completed Example from within TIP TOP TOES
		
		
		appointment request 
		

[10]

(c) (i) Who should be involved with the creation of the first of these diagrams?

_____ [1]

(ii) Explain your answer.

_____ [1]

- 8 In order to ensure that the new system is working properly, several types of testing will be carried out.

Testing is carried out at various stages within the system development life cycle.

- (a) (i) Explain what is meant by program testing.

[1]

- (ii) Who should carry out program testing?

[1]

- (b) (i) Explain what is meant by system testing.

[1]

- (ii) Who should carry out system testing?

[1]

- (c) (i) Explain what is meant by acceptance testing.

[1]

- (ii) Who should carry out acceptance testing?

[1]

The proposed structure for the **APPOINTMENT** table is shown below:

Field Name	Data Type/Size	Required?	Comments	Sample Data
Appt No	Auto number	Yes	Primary key – uniquely identifies each appointment	10004
Date	Date/Time	Yes	Appointments can only be made for Mon–Fri	03/07/09
Time	Date/Time	Yes	Opening hours are 8 am to 8 pm	10:30
Client No.	Text, 4	Yes	Foreign key – links to CLIENT table	C002
Attended?	Yes/No			Yes
Treatment Code	Text, 6	Yes	Foreign key – links to TREATMENT table	CH0087
Paid?	Yes/No			Yes

(d) The table below shows appointments which have been rejected by the new system. Complete the table by giving a reason for the rejection of each appointment.

Appt No	Date	Time	Client No	Attended?	Treatment Code	Paid?	Reason for rejection
10100	02/07/09	07:30	C009	Yes	BY1009	Yes	
10102	02/07/09	12:30	C029	No	CH0087	No	
10200	06/07/09	10:45	C009	Yes			

[3]

Examiner Only	
Marks	Remark

- 9 Janet has decided to put a separate computer within each of the treatment rooms at TIP TOP TOES.

Complete the table below by stating whether each statement is either **true** or **false**.

A Local Area Network within the business will mean that data can be stored centrally.	
Clients will be able to view personal details of other clients.	
All appointment data and client data can now be viewed on screen.	
A separate printer will be needed in each treatment room.	
All therapists will have to be trained in the use of the new system.	
TIP TOP TOES will still need a secretary.	

[6]

10 Janet has recently read an article about computer security issues and she is keen to ensure that her business data is adequately protected.

Identify with a tick (✓) **four** security procedures which you think **must** be adhered to by staff at TIP TOP TOES:

Therapists should each have a unique logon code for the system.	
The backup file should be stored on CD in the filing cabinet in the reception area.	
TIP TOP TOES should register with the Data Protection Registrar.	
A full system backup should be carried out each night.	
Therapists should write their password in their appointment book.	
The secretary should always lock her computer if she is walking away from the main reception desk.	

[4]

11 The project manager at DYNAMIC DESIGNS has suggested that as a next phase of the project, a web presence is developed for TIP TOP TOES.

(a) Give **two** advantages of having a web presence for the business.

Reason 1

_____ [1]

Reason 2

_____ [1]

(b) Janet has decided to set up an email account for the business. Give **two** reasons why this would be useful?

Reason 1

_____ [1]

Reason 2

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

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2009

**Applied Information and
Communication Technology**

Case Study
Assessment Unit A2 7
assessing

Unit 7: Investigating Systems

[A6J11]

MONDAY 12 JANUARY, AFTERNOON



A6J11CSI

You must use **this** clean copy of the Case Study in the examination and not your own annotated copy.

TIP TOP TOES

TIP TOP TOES provides the ultimate in foot care for the public. Opened in Bangor in 2002, the TIP TOP TOES private clinic has now more than 1000 clients. The owner of the business Janet Legg, a highly qualified chiropodist, came up with the idea of providing more than just a chiropody service to the public. Along with all of the normal facilities offered by this kind of practice, she decided to make a total range of foot care available to the public. The services include chiropody services, foot therapies and treatments. A full range of foot care products is also available for purchase.

Janet put a great deal of effort and money into launching the business and there is no doubt that it is hugely successful. The clinic is open Monday to Friday from 8am until 8pm. Janet believed that this would be very helpful to people who would have to make arrangements to leave work to attend appointments. This has proved to be absolutely correct and is one of the many advantages the clinic offers. The clinic also provides a home visit service which is of particular benefit to elderly clients. Home visits are conducted in the mornings on Monday, Wednesday and Friday and in the afternoons on Tuesday and Thursday. Janet is also considering the possibility of Saturday opening.

The clinic is staffed by Janet and four other fully trained chiropodists as well as a therapist, two secretaries and two cleaning staff. The secretaries work either from 8am until 2pm or from 2pm until 8pm. At any one time there are at least two trained chiropodists working in the clinic with a third one doing the home visits. The therapist is available every day from 2pm until 8pm.

There is a huge demand on the resources of the clinic because of its popularity. The staff are stretched to the limit and on a day when someone is sick it is sometimes necessary to reschedule times by trying to fit clients in with one of the other chiropodists or to just cancel the appointment. The secretary will first of all try to accommodate the client with another chiropodist and if that does not work will try to cancel the appointment and agree an alternative one over the phone. This is not very satisfactory for the client and there have been occasions when it has not been possible to contact a client and they have turned up. This is not good for the business and if this happens, Janet allows the next appointment free of charge.

When the therapist is off, there is no alternative other than to reschedule the appointment.

Clients can make appointments for chiropody services (15 minute duration), foot treatment services (30 minute duration) or therapy services (30 minute duration). Sessions can be booked in multiples of these time slots if a double session or more is required for a particular service.

Appointment books are kept beside the telephone in the reception area. There is one book for Chiropody / Treatment and one for Therapy services. Time is marked in 15 minute intervals on the left hand side of the page. The secretary has a weekly schedule on the notice board indicating which staff members are working in each time slot for that week. Every Monday, the secretary will blank out the times each staff member is not available for each day of that week and indicate who is doing the home visits for that week.

The secretary must also indicate the type of appointment by writing C (chiroprody), TR (treatment) or TH (therapy) after the name.

When a client first makes an appointment, usually by telephone, the name, address, telephone number and type of appointment is recorded in a 'New Client' notebook and an appointment card is sent out. The appointment is then recorded in the relevant appointment book.

Existing clients can book further appointments on the day of their treatment or by telephone. These are recorded in the same way.

When a new client attends for the first time, an extra 15 minutes is assigned to the appointment time. This is to allow time for a client history to be recorded as a file has to be created for each client. This file has to be updated each time the client attends thereafter. The secretary must have these records filed by either 2pm or 8pm each day. In addition, the files for the next day must be selected and placed in order of appointment time for each member of staff. The client history files must be updated by the staff member at the end of each appointment and left for filing by the secretary.

Clients can pay immediately after their appointment by cash, cheque, debit or credit card. They are given a receipt of payment and the transaction is noted in a payment ledger book. This book is organised by date and the secretary records the client name, the amount and the transaction type (CA cash), (CH cheque), (D debit), (CC credit card).

Alternatively, clients who are having a course of treatment receive an invoice at the end of their treatment. Payment may be made in person or by post using any of the methods noted already. The transactions are recorded in exactly the same manner and receipts are issued accordingly.

Clients wishing to purchase foot care products make their request and if the product is available, they pay the secretary by cash, cheque, debit or credit card. Again these transactions are recorded in the payment ledger book (P – purchase) and a receipt issued. If the required product is not in stock, the secretary notes the item and places it on a stock out list. The secretary is responsible for ordering stock at the end of each month and must record the orders in a stock order book. The secretary must also take care of stock deliveries and ensure that the original orders match the delivery details. Sometimes this is not the case and the supplier must be notified. Invoices are also received from suppliers and the supplier payment issued. Supplier receipts are recorded.

Management of the stock is problematic because there is often quite a delay from when an item is out of stock until when it is replaced. Clients are generally not too happy about this especially since the chiroprodists and therapist will frequently recommend particular products to them.

The secretaries find the whole process very tedious and time consuming. In addition to this, Janet is not keen to carry too much stock. Space is an issue as well as the unpredictability of sales and the worry of being left with a lot of expensive items.

The secretary must also deal with cancellations and clients who do not attend. When a cancellation is made, the secretary crosses out the client name in the appointment book and makes a note of the time slot and available staff member on a 'spare appointment' list. Often, clients will ring up looking for an immediate appointment. Their details are recorded on a 'waiting list'. The secretary tries to allocate the available cancellations on a 'first come first served' basis unless a genuine emergency arises.

Cancellations are accepted up to 24 hours before the appointment, otherwise a cancellation fee of £10 is imposed. This amount must be paid before any further appointments can be made. Clients who cancel without appropriate notice and clients who do not attend for an appointment are billed for this amount. Payments can be made in the same way and are recorded in the payment ledger book (B – bill). The client details are recorded in a Non Attendance book. When the payment is made, the client name is crossed off. Sometimes clients manage to make further appointments in spite of having an outstanding fee to pay because the secretary does not remember. This is unsatisfactory and can lead to some embarrassment for the secretary who has to request payment before the appointment can proceed. Some clients actually claim that they have made the cancellation payment and this is even more difficult to deal with.

Janet is facing a range of issues that must be addressed to ensure that her business continues to be successful. She is aware that there is significant manual effort involved in all of the administrative processes associated with the business. She is also very aware that the only way she can obtain any useful management information is by physically looking through records and files. She cannot generate useful reports. She cannot track client history, money or stock. Janet has decided to seek advice!