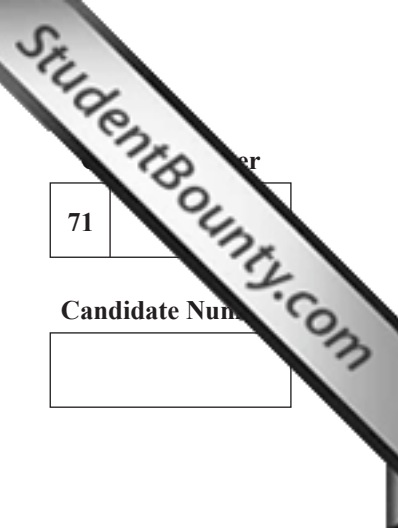




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Candidate Number	
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Applied Information and Communication Technology

Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]

FRIDAY 27 MAY, MORNING



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 **questions 3, 6, 10 and 11**.
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	5		
3	6		
4	4		
5	11		
6	19		
7	6		
8	10		
9	14		
10	12		
11	8		

Total	100		
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1 Three of the problems identified at SQUEAKY CLEAN are listed below.

Complete the table below to provide **one** reason why each of these problems will have an effect on the business and also suggest a possible solution. The solution does not always have to involve computerisation.

	PROBLEM	EFFECT ON THE BUSINESS	POSSIBLE SOLUTION
1	Customers find it difficult to renew their contracts as Fiona has other commitments and is not always available.		Not necessary for Fiona to deal with renewals as these should be straightforward. She should allocate this responsibility to another member of staff. Fiona could be asked to schedule one half day each week to be on the premises.
2	Caroline is sometimes not able to visit a new client for up to two weeks.		
3	Harry has too much paperwork to deal with.		

[5]

- 2 A list of objectives has been drawn up for the proposed new system at SQUEAKY CLEAN. Identify with a tick (✓) **five** suitable objectives.

OBJECTIVE	SUITABLE
Reduce costs for clients.	
Calculate staff wages.	
Maintain an inventory of stock and equipment.	
Provide training for staff.	
Deliver an excellent cleaning service for clients.	
Record client contract details.	
Facilitate easy renewal of client contracts.	
Produce invoices and record payments received.	

[5]

- 4 ABSOLUTE ANSWERS favour the use of DSDM over SSADM. Identify with a tick (✓) those features from the table below that might suggest that DSDM is the better choice in this case.

FEATURE	DSDM
Encourages user involvement throughout the duration of the project.	
Highly structured.	
Suitable for large organisations.	
Makes use of prototyping.	
Insists on highly defined documentation at each stage of the project.	
Generally delivers the project on time and within budget.	
Prioritises user requirements.	

[4]

- 5 Terry has been asked to put forward a list of people who should be involved with fact finding activities, giving the reason for their involvement.

Complete the following table:

EMPLOYEE	REASON FOR INVOLVEMENT	FACT FINDING TECHNIQUE(S)
Fiona Duffy	Has responsibility for all legal documentation within the business. Will draw up the contract with ABSOLUTE ANSWERS.	Interview
Caroline Smyth		Interview
		Observation
	Only one person involved in this part of the business so will have specific requirements that others may not be aware of.	
	Need to find out exactly what paperwork is used by the people who provide services for clients. Important for the analyst to see the sort of problems experienced during a typical working day.	
Customers		
	Timescale and budget must be defined.	Interview
	Provide copies of all documentation and explain problems with current process. Enable a first-hand view of the business activities to be obtained.	Interview

[11]

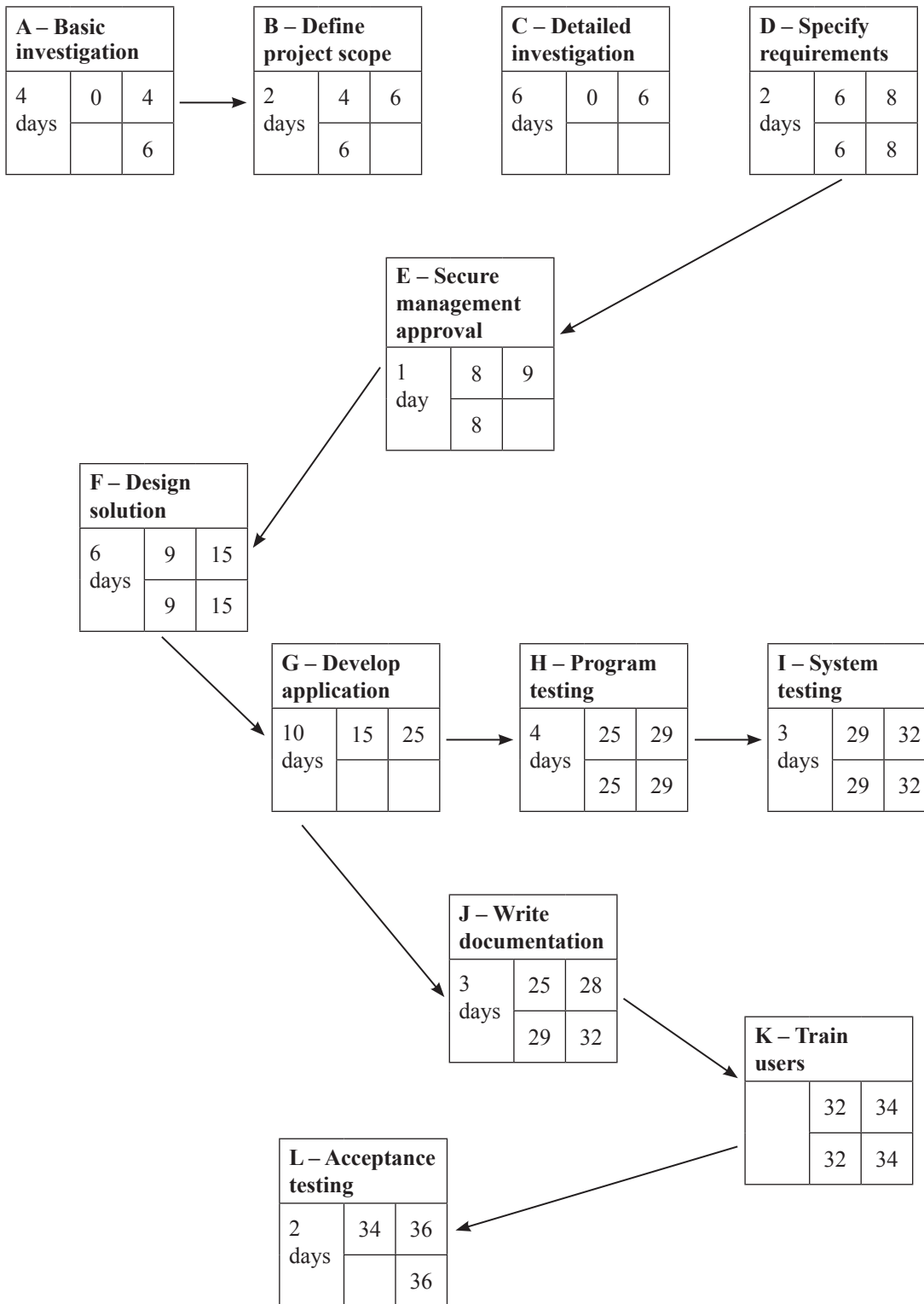
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(Questions continue overleaf)

6 The following schedule has been drawn up for the project.

ACTIVITY	DESCRIPTION	PREDECESSOR	DURATION (DAYS)
A	Basic investigation	–	4
B	Define project scope	A	2
C	Detailed investigation	–	6
D	Specify requirements	C	2
E	Secure management approval	B, D	1
F	Design solution	E	6
G	Develop application	F	10
H	Program testing	G	4
I	System testing	H	3
J	Write documentation	G	3
K	Train Users	I, J	2
L	Acceptance testing	K	2

(a) Use the table opposite to complete the network diagram which has a range of elements missing including connections between activities.



[12]

(b) Which activities in this project are on the critical path?

_____ [1]

(c) James feels that he should save some time on the project. The budget allows for another technical person to be added to the project team. What type of computing professional should be employed in order to have the greatest impact on the project timescale? Provide specific examples in your answer.

_____ [6]

- 7 Following on from the context diagram which has already been produced, Jane has been asked to start creating a level 1 diagram. Complete the following table to show whether her statements are TRUE or FALSE:

STATEMENT	TRUE/FALSE
Level 1 diagrams provide less detail than the context diagram.	
Level 1 diagrams can only contain the entities that existed in the context diagram.	
Files do not need to be included on a level 1 diagram.	
Several level 1 diagrams can be completed for each context diagram.	
The level 1 diagram should be used for discussion with the technicians.	
The files that appear on your level 1 diagram should also exist on your entity relationship model.	

[6]

8 Invoices are created at the end of each month. Fiona has asked Harry to manually record summary details for each invoice produced. This is very time consuming and as a result, sometimes errors are made. A sample of what Harry records is shown below:

Invoice date: 30th March 2011 **Send first reminder:** 7th April 2011
Send second reminder: 14th April 2011
Send final reminder: 21st April 2011

INVOICE NO	CLIENT NO	AMOUNT DUE	PAYMENT DETAILS
10022	C005	£200	
10023	C006	£145	
10024	C010	£270	Payment 18th April 2011
10025	C097	£150	
10026	C001	£340	
10027	C002	£90	Payment 5th April 2011
10028	C089	£145	
10029	C056	£75	Payment 18th April 2011

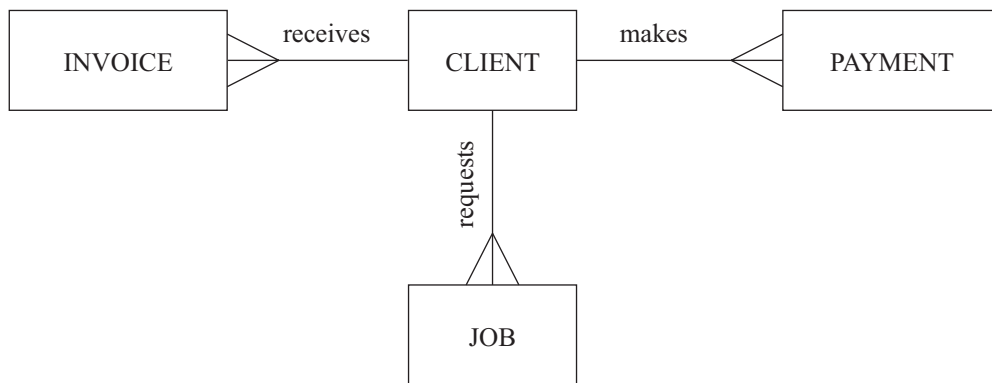
Total number of invoices sent: 8
Total invoice value: £1415

The analysts intend to generate this report automatically from the new system. As part of the system specification, a summary of all output requirements must be produced. Complete the table below to explain why each field is included and state whether the field is calculated or stored within the system.

FIELD NAME	PURPOSE	CALCULATED or STORED
Invoice Date		STORED
Invoice No	To uniquely identify an invoice.	STORED
Client No		
Reminder dates		
Amount due		
Total invoices sent		
Total invoice value	Total value for all invoices – based on sum of all jobs for the last 30 days.	

[10]

9 An initial version of the database has been created, the design of which is shown below.



(a) Complete the following data dictionary for the PAYMENT table.

FIELD NAME	DATA TYPE/ SIZE	REQUIRED?	COMMENTS	SAMPLE DATA
Payment Ref	Text, 6			PR0098
		Yes	Foreign Key – links to CLIENT table	C002
Payment Date		Yes	Default to today's date	15/06/2011
		Yes	Must be greater than 0	

[8]

When negotiating contracts with clients, Terry has said that she would find it useful to have a summary payment history for each client. For each invoice sent to a client, there can be up to three reminders.

A sample of her requirements is shown below:

CLIENT NAME	JOBS COMPLETED	INVOICES	REMINDERS		
			1st	2nd	Final
Fred Smith	140	12	6	3	1
James Elliott	100	10	10	10	10
Mary Friel	80	8	1	0	0
Joyce Small	150	12	8	2	1

(b) In order to produce this, the junior analyst has suggested adding an extra table to the database to store reminder details. Suggest **three** fields that should be stored in this table.

(i) Field 1 _____ [1]

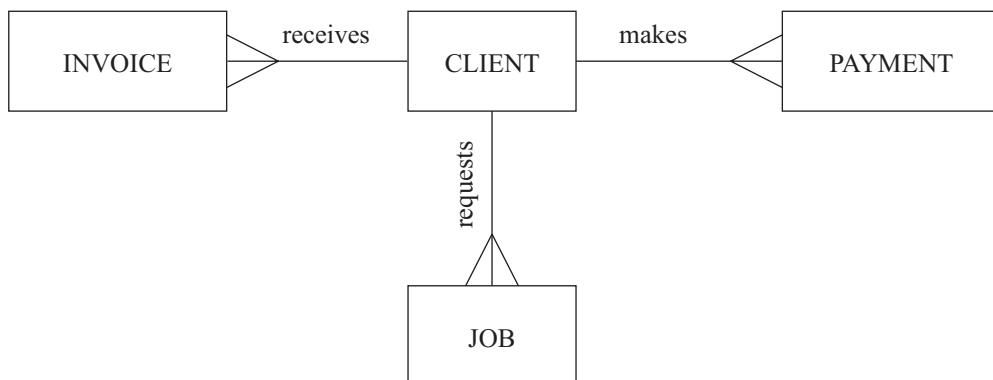
Field 2 _____ [1]

Field 3 _____ [1]

(ii) Which of the above fields would be a suitable primary key for the table?

_____ [1]

(c) Complete the diagram below to show how the new table will be linked to the existing structure.



[2]

10 Within the system development lifecycle, a range of tests must be conducted.

(a) Explain the following types of testing.

(i) Program testing

[2]

(ii) System testing

[2]

(iii) Acceptance testing

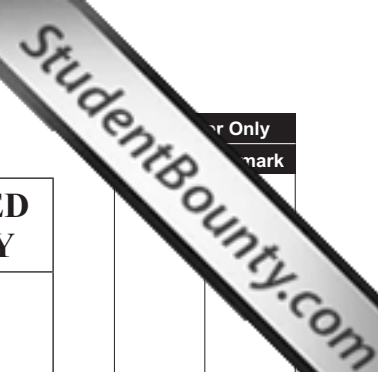
[2]

The junior analyst has created a partial test plan as shown below.

SEQUENCE	ACTIVITY	CARRIED OUT BY
1	Check that correct discounts are being calculated for each of the 5 possible contract options.	Harry
2	Ensure that job details are all being recorded and charged to the correct client.	Analyst
3	Check that a new contract can be established for an existing customer.	Harry
4	Review all user documentation to ensure that it is correct.	Analyst
5	Check that a new printer can be installed correctly.	Programmer
6	Ensure that tables meet requirements as outlined in the entity relationship diagram and data dictionary.	Programmer

(b) James is happy with the suggested activities, but considers that other aspects of the plan should be amended. Discuss how the plan could be improved.

[6]



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11 When trying to decide which method of system changeover to adopt, Terry and Fiona have been asked a series of questions. Some responses have been listed below.

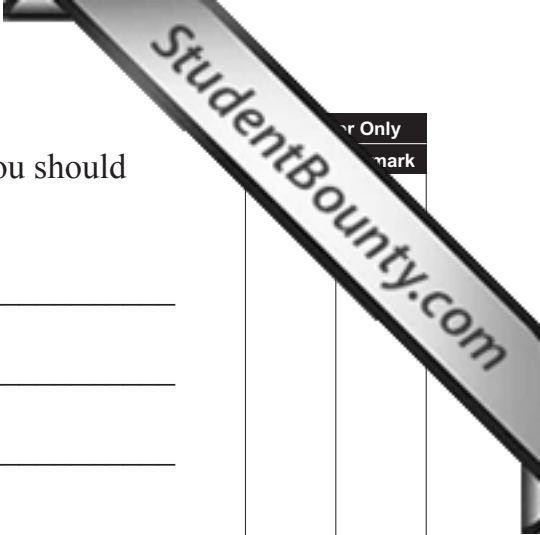
Could you afford to close the business for a few days?	<i>"We'd rather not"</i>
Could you afford to employ extra administration staff?	<i>"No"</i>
Could you start recording all your customer contracts in the new system while still producing your invoices manually?	<i>"Yes – this would be good rather than trying to change everything at once"</i>
Is there a quiet time of year for your business?	<i>"Beginning of August – but this is when we generally take our summer holidays"</i>

(a) (i) Based on the answers given, which method of system changeover would you recommend for SQUEAKY CLEAN?

_____ [1]

(ii) Justify your choice for part (a)(i).

 _____ [1]



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(b) Describe **three** other methods of changeover. Explain the circumstances under which each of these could be used. You should refer to advantages and disadvantages of each technique.

Lined area for writing the answer, consisting of approximately 15 horizontal lines. The text [6] is located at the end of the final line.

THIS IS THE END OF THE QUESTION PAPER

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**Applied Information and
Communication Technology**

Case Study
Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]

FRIDAY 27 MAY, MORNING



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

Squeaky Clean

Squeaky Clean is a thriving company formed three years ago by two solicitors, Terry and Fiona Duffy. Tired of juggling the needs of their young families with busy professional lives, they realised that there was a definite market for cleaning services. Both had previously considered getting some domestic help at home, but found difficulty in getting help at the right time and at the right price.

Aware that for many people, the cost of getting domestic help would be well outside the normal family budget, Terry and Fiona considered carefully how this kind of service could be made accessible to the public. It took quite a while to work everything out but with professional advice and their own legal knowledge, Terry and Fiona started a domestic cleaning company, "Squeaky Clean". They agreed financial terms and conditions and Terry initially decided to manage the company on a full time basis while Fiona would currently retain her legal career. As well as being co-owner of the company, she would have responsibility for dealing with all contracts generated in the business as she is an expert in this particular aspect of the law.

Squeaky Clean is fully committed to delivering an excellent service to the public. All staff are fully vetted; they are fully trained and must comply with all company rules regarding the conduct of their work. Apart from the directors, Terry and Fiona, Squeaky Clean currently employs a manager, a secretary and 20 full time staff including a driver. The company retains a bank of part time staff who can be called on if necessary. The company also owns a van for transporting equipment to particular jobs. Sometimes industrial cleaning machines are required and the van is used to deliver these to the premises on the night before and to collect them on the day after a scheduled job.

A major objective for Terry and Fiona was to provide a good value quality service. Research into the provision of domestic cleaning services in the area, found little evidence of any kind of reasonable service. They did find advertisements for individuals charging over £20 an hour for very basic cleaning with no guarantee of any kind of quality control. However, there was no company at that time providing what they thought they could offer.

Terry and Fiona realised that they had to come up with a range of options that would attract potential customers and create loyalty to the company. They decided to offer a range of contract options that would have different associated discounts. All services carry a minimum time of one hour. It would not be cost effective to place a member of staff at a location for any less time since travel time and transport must also be considered. These options include the following:

- Option 1 **"One off service"** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour with one cleaner present.
- Option 2 **"Four week contract"** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour each week over a four week period. The first week is charged at the full rate and then a discount of 5% is applied to the following three weeks.

- Option 3 **“Twelve week (three month) contract”** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour each week over a twelve week period. The first week is charged at the full rate and then a discount of 5% is applied to the following three weeks. For the remaining eight weeks, a discount of 7% is applied.
- Option 4 **“Twenty six week (six month) contract”** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour each week over a twenty six week period. The first week is charged at the full rate and then a discount of 5% is applied to the following three weeks. For the next eight weeks, a discount of 7% is applied. For the remaining fourteen weeks, a discount of 10% is applied.
- Option 5 **“Fifty two week (one year) contract”** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour each week over a fifty two week period. The first week is charged at the full rate and then a discount of 5% is applied to the following three weeks. For the next eight weeks a discount of 7% is applied. For the next fourteen weeks, a discount of 10% is applied and for the remaining twenty six weeks, a discount of 12% is applied.

All contracts must be renewed on expiry before any further service can be provided.

Terry oversees the overall day to day running of the company. The secretary, Harry James, deals with all enquiries relating to new clients. He is required to get the new client to complete a “job enquiry” form. This form requests the client contact details and allows the client to select particular services that the company provides. This is mainly done by ticking boxes but there is space on the form for the client to add additional information regarding requirements. Terry and Fiona sometimes review these forms and get new ideas for extending their range of services.

The secretary provides limited information to the client and then passes the “job enquiry” forms to the manager Caroline Smyth. Caroline visits every new client and assesses the job. This is a very time consuming activity and because of the growing number of clients, Caroline is sometimes not able to visit for up to two weeks. Some clients are unhappy with the delay and do not proceed with the enquiry and so potential customers are lost.

Caroline defines the exact client requirements, recording them on a “client requirement” form and then costs the range of options available. Caroline prepares a “costing summary” form which is sent out to the client for consideration. She passes copies of all forms to Harry who sorts them in date order and files them. When the client provides a response to the costing, whether by calling in to the office or by telephone, Caroline will get the “client contract” drawn up. All contracts must be copied and posted to Fiona for approval before being sent out to the client. Fiona calls into the office once a week to indicate approval and sign new contracts.

Once approved, the contract is sent to the client and should be signed and returned before any service can be supplied. Once the signed contract has been returned, they must be filed. The secretary, Harry James, is responsible for this. These procedures also apply to renewal of contracts. The whole process is very labour intensive and time consuming. It depends on Harry

getting everything done on time and because of the volume of work he has to do, happens. Clients are not pleased when they have to contact the office to see what is the delay.

Sometimes because of other commitments, Fiona cannot visit the office and there can be a two week delay. Harry is aware that an increasing number of customers have said they will not be back. Renewal customers are particularly dissatisfied as they feel they have shown commitment to the company.

Caroline also prepares “task schedules” for the cleaners. All cleaners must collect their “task schedules” for the following week on a Friday afternoon before 6pm. Every job has an associated task schedule. The cleaner must sign the “task schedule”, indicating that the work has been completed and return it to the office before 4.30pm on the following Friday. This signed document is used by Harry to record that the work has been done so that invoice information can be generated. It is also used to calculate wages for the part time staff as they are paid by the hour rather than at the weekly full time rate. Sometimes staff members forget to sign the task schedule. If Harry is not available to check the schedules on Friday afternoons, payment authorisation for part time staff who have not signed the forms is not allowed. This has caused a lot of problems as there will be a delay of one week in payment to the staff. The staff believe that this is unacceptable.

The van driver is also given a weekly “task schedule”. He is responsible for checking the equipment before he delivers it and checking it after he collects it. Any damage must be recorded on a “damage report” form which is left in the office for Caroline who will decide if any action must be taken. This might include interviewing the staff involved or perhaps charging the client a breakage fee if the damage is their fault. This does not happen very often but if a client is considered responsible for damages, Caroline creates a “damages demand” which is sent to the client. A “damages payment” is expected within two weeks otherwise the normal demand procedures will follow.

The company provides all cleaning material and equipment for the services they provide. Cleaners are supplied with their cleaning kit comprising a whole range of cleaning products and portable cleaning gear. They must request replacement products and cleaning gear on a “cleaning kit request” form when they submit their signed task schedule forms on a Friday. Replacement supplies are available for collection the following Friday and each cleaner is required to sign a “cleaning kit receipt” so that a record is kept of their stock usage. Harry is responsible for managing this process and must file the “cleaning kit request forms” and the “cleaning kit receipts” for audit purposes.

Caroline reviews the “cleaning kit request” forms before Wednesday of each week. She is responsible for authorising replacement items for the cleaning staff. She monitors this very closely and will check the validity of the request by looking at the “task schedules” for the cleaner concerned.

Harry is required to maintain stock items for the cleaning staff. He tries to check the stock at least once a fortnight. Harry must complete “stock request” forms for low stock items. These must be approved by Caroline before Harry creates “stock orders” for the suppliers. He has to issue these, ensure that the subsequent deliveries are accurate and the stock updated, record the supplier invoices and then make sure that the suppliers are paid. Sometimes stock items are not available

for staff simply because Harry has not been able to complete the whole stock order procedure within the required timescale. This is problematic for the cleaners who either try to purchase materials themselves or ask the client. Some clients have complained to Caroline that they are not getting the full service they agreed in their contracts.

Invoices for Option 1 clients are created on the Monday following the completion of the work. All other clients are invoiced monthly. Invoices are posted out to clients and payment is expected within one week. Clients may pay by cash in person or credit or debit card over the phone. The company has discontinued the practice of payment by cheque in line with most other organisations. There is a considerable amount of work involved in generating the invoices. As Harry is responsible for answering the phone, dealing with clients as well as a whole range of other tasks, he finds it hard to get suitable uninterrupted time to do this. Some days, he either comes in very early in the morning or stays on later at night. He is very worried and under pressure at present as he realises that he is at least two weeks behind in creating the invoices.

Harry is also responsible for regularly checking that payment has been received for all invoices. With a growing number of clients, it is becoming impossible to keep up with this. He is also required to issue first, second and final "reminders" to clients. If a client fails to pay within two weeks of a final reminder, Harry is required to advise the manager who issues a "discontinuation of service" notice to the client. This notice also advises clients of the legal consequences of non payment. Terry and Fiona are sent copies of all discontinuation notices and deal with the legal aspects themselves.

Harry has on occasion not recorded client payments. This has resulted in clients being sent out reminders.

The business is very successful but the administrative processes are becoming totally unmanageable. The amount of paper generated is impossible to manage effectively. Caroline has proposed the appointment of at least two new staff to assist with all the work that must be done.

She believes that Harry could be a great help to her in the assessment and costing of new jobs if he could be released from some of his office duties.

She is also of the opinion that they could make good use of better computer facilities. At present, Caroline and Harry have standalone PCs and they have to share a printer. They have no Internet access and they have no means of sharing any data easily. They use basic application software and have no formal training at all.

Caroline is concerned at the growing number of clients who want an instant response to their requests and who are dissatisfied with the time it takes to generate the responses they receive. She is very aware that clients are not happy with the invoicing system. She is concerned that any bad publicity arising out of poor administration could affect new business. Clients might well look elsewhere for services.

