

Teacher Resource Bank

GCE Information and Communication Technology
INFO3 The Use of ICT in the Digital World

Candidate exemplar work



INFO3 Exemplar work

These support materials for teachers of GCE ICT provide examples of candidates' answers to the questions set for the January 2010 examination. These answers should be read in conjunction with the *Report on the Examination* and the *Mark Scheme*, which are available on [e-AQA](#).

The example answers have been chosen to show both exemplar answers and answers that failed to achieve the maximum marks available. A commentary from a senior examiner accompanies each selected answer.

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QUESTION 1(a)

1 Pharwel has a large and unmanaged backlog of maintenance tasks.

1 (a) Explain what is meant by:

1 (a) (i) adaptive maintenance.

This is changing something in the system to meet a new requirement. This could be the ~~running~~ implementation of a backup server in to the system.

(2 marks)

1 (a) (ii) corrective maintenance.

This is fixing any errors that are reported in the system by the user. For example ~~the~~ when a user finds they can't connect to the company network from their laptop.

(2 marks)

1 (a) (iii) perfective maintenance.

This is changing something so that it will work more efficiently, even though it is not broken. For example increase the network speed throughout the organisation.

(2 marks)

Commentary

The examiners were looking for a short definition or explanation of each category of maintenance, plus an extension or example. These answers contain an acceptable definition but the examples given are for support or requirements change, rather than maintenance. See the *Mark Scheme* for example answers.

QUESTION 1(b)

- 1 (b) Briefly discuss the practical difficulties that Pharwel could experience in implementing maintenance changes to the PC based sales system.

When trying to implement ~~the~~ maintenance changes to the PC based sales system it will be difficult to make sure that all 250 PC's are changed due to the large geographical area that the sales representatives cover. The change could therefore be implemented during one of the monthly sales visits. By making maintenance changes you are also putting the system at risk from more potential errors. This will be hard to monitor again because of the large ~~see~~ geographical area of the users. Also as the changes are most likely going to be implemented by a number of specialist over a length of time, each change might not be ~~so~~ identical to each other which could lead to compatibility issues.

(5 marks)

5

Commentary

This candidate has gained full marks by successfully discussing the practical difficulties. The difficulty implied by the number of PCs and the geographical spread has been highlighted and a possible solution suggested in the reference to the monthly sales visits. An alternative solution is also discussed (implementation by specialists over a length of time) and the comment about compatibility issues demonstrates understanding.

QUESTION 2

- 2 Compare the two redevelopment options suggested to Pharwel by the consultants. Recommend and justify one option.

Pharwel have two options as they could either have an in-house developed system or an externally developed system.

In Pharwel's case, I would recommend that they contract the development out to an external team, for a number of reasons.

Firstly, because it would mean that the current staff in the ICT department could focus on their everyday tasks instead of having to attempt at developing the software at the same time, meaning they can't give 100% to both tasks.

Secondly, the external developers would be more professional as developing new systems is their usual job, whereas the in-house team would be less familiar with creating systems whilst sticking to timescales and delivering deliverables on time.

External developers could have more experience in the field of systems developing too. Their team would consist of a better balance of skills so that problems could be sorted more quickly as there would be better and deeper knowledge across more areas.

Using external developers would also mean that there could be more formal methods. Formal methods such as documentation means that the development is more structured and that the clients' requirements will be more likely to be achieved.

7
7
7

Commentary

This candidate gained full marks.

The candidate starts with a clear recommendation and then provides at least six valid comparison points. Some candidates failed to gain maximum marks by not including sufficient comparison points or by omitting the requirement for a recommendation.

QUESTION 3(a)

- 3 (a) Using examples from the case study, discuss the factors that should be considered when devising a new backup strategy for Pharwel.

In the backup strategy, Pharwel should do a risk analysis. They should highlight the potential ~~threats~~ ^{threats} to the system, such as floods or viruses and make sure that the staff are aware of them and know what to do should they occur.

Pharwel should consider when is the best time to backup the system, preferably when the system isn't very busy, such as every Friday late evening when most workers will have gone home. As the system runs continuously, they should consider an incremental backup at the end of every day and then a full backup once a week.

Pharwel should look at the storage medium for the data. For their company, portable devices would be unsuitable as they are too small and can be easily lost. Magnetic tapes would be more appropriate for the main storage.

The company should also think about (8 marks) who will be responsible for the backup. They could assign Question 3 continues on the next page a team member to be in charge of backing up the system each week or decide that each colleague backs up their own storage area and all its contents.

7

Commentary

The candidate gained seven of the available eight marks. Because risk analysis was contained within the pre-release document, no marks were available for the first paragraph. The second and third paragraphs identified the timing, type and storage media factors and related these to Pharwel's situation as described in the pre-release material. However, only one mark was awarded for 'responsibility', as this point was not expanded in any meaningful way.

QUESTION 3(b)

- 3 (b) Compare the effectiveness of the “hot” and “cold” restart recovery options for Pharwel.

A 'hot restart' facility would mean that Pharwel would have little delay in running the system again after it has been down. The mirroring of the system uses live data, so there would be no backlog and another takes care of the site for Pharwel so they wouldn't have to take time to buy and install all of the hardware, software and furniture copies themselves. A 'cold restart' facility would ~~not~~ be cost effective. as they are only paying for the office space. The electricity and plumbing would be ready in place for them to move their own equipment into after the breakdown of the usual system.

Commentary

A mark was given for identifying that the hot restart would involve some delay. No marks were available for 'mirroring', as this is relevant to backup, not the hot restart scenario described in the case study. However, a further mark was given for identifying that there would no need to purchase hardware and software.

For the cold restart, marks were given for identifying that it would cost less and that there would be services supplied.

In general, this question was not answered well, with many candidates merely repeating the words used in the case study.

QUESTION 4(a)

Candidate 1

- 4 Explain how each of the following procedures help Pharwel comply with current legislation.
- 4 (a) Staff must not use USB flash memory devices, or any similar device, to store copies of personal data used by Pharwel.

Personal data can also be sensitive data, which, if stored on USB flash memory devices, could easily be lost or get into the hands of unauthorised personnel. Banning the storage of this sort of data on USB devices helps Pharwel keep in compliance with the Data Protection Act. (2 marks)

Candidate 2

- 4 Explain how each of the following procedures help Pharwel comply with current legislation.
- 4 (a) Staff must not use USB flash memory devices, or any similar device, to store copies of personal data used by Pharwel.

If the USB is lost the information could end up in the wrong hands causing them to breach data protection act of customers.

(2 marks)

Commentary

Both of the candidates above identified that sensitive data could easily be lost if stored on flash memory devices. However, both failed to explain that the DPA requires that personal data must be held securely.

QUESTION 4(b)

- 4 (b) Staff must not attempt to gain unauthorised access to company data. This will result in instant dismissal.

Attempting to gain
Unauthorised access is ^{mentioned as an offence} one of the three sections of the Computer Misuse Act. This is sometimes known as hacking, which is illegal. Stopping staff from doing this means Pharwel is trying to keep its employees from violating the Computer Misuse Act.

(2 marks)

2

Commentary

This candidate provides both a brief explanation of relevant legislation and goes on to explain how Pharwel discourages violations of the legislation. Full marks.

Question 4(c)

Candidate 1

- 4 (c) All staff that are required to use display screen equipment must receive training during their induction course.

Using display screen equipment without training can result in injury, loss of eyesight or eyestrain. Under the Health & Safety at Work Act, it is Phaswel's duty to ensure staff are trained to minimise health risks to themselves (and other). Phaswel are fulfilling this duty by ensuring new staff receive training (2 marks)

2

Candidate 2

- 4 (c) All staff that are required to use display screen equipment must receive training during their induction course.

This will ensure they know what they are doing and will be able to comply by the company policy.

(2 marks)

Commentary

Candidate 1 describes the requirements of current legislation, together with the implications of non-compliance, and gains full marks.

Candidate 2 has provided a far too generalised answer and fails to gain any marks.

Question 4(d)

Candidate 1

- 4 (d) Staff are not permitted to make copies of any software product used by Pharwel without company permission.

This will ensure copyright as they may not be licensed to use the software elsewhere than on the premises.

(2 marks)

0

Candidate 2

- 4 (d) Staff are not permitted to make copies of any software product used by Pharwel without company permission.

The Copyright, designs and patents act states it is illegal to make or distribute copies of (intellectual property such as) software unless authorised by the creator. If Pharwel uses certain software they will have obtained licenses for its use on a certain number of computers and the license probably would not cover copies of software made without company permission.

2

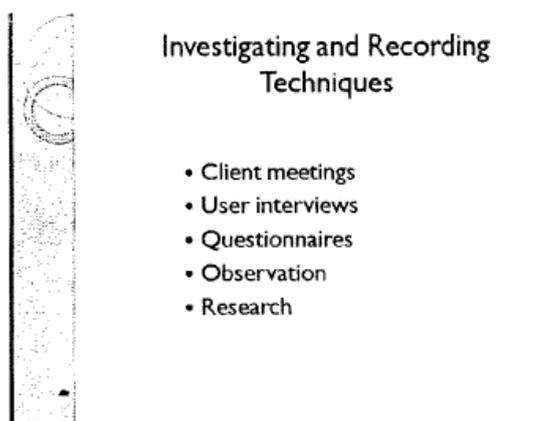
Commentary

Candidate 1 provides a vague and incomplete answer and no marks were awarded.

Candidate 2 states clearly the legislative requirements and provides a lucid account of Pharwel's legal situation, gaining full marks.

Question 5

5 The following slide is part of a presentation being given to trainee systems analysts.



Write notes to accompany each bullet point, explaining the technique and how and where it could be used appropriately. (15 marks)

'Client meetings' is a technique which will involve the analyst going having a face-to-face meeting with the client. This meeting will most likely be held in interview form and the analyst will use it to get a good understanding of what the client requires from the solution. The meeting would most likely take place at a place of the client's request so that it is suitable to his schedule.

'User Interviews' are interviews conducted with the individuals who are going to use your solution once it is in operation. The analyst would have pre-made questions in which he would use to see what the

user expects from the solution. Only a few users would be interviewed preferable at different levels within the organisation and the interviews would most likely take place at the users place of work.

'Questionnaires' would be used to get feedback from a wide range of users throughout the organisation. They would consist of various questions asking the user about both the old current and of new system and giving them the chance to provide any additional feedback. The questionnaires would be distributed through the organisation and filled in during working hours.

'Observation', this is a method in which the analyst will shadow the current a user using the current system. This gives the analyst a good understanding of how the current system works and indicates things that need to be included in the new system. Observation would take place in the users work place during working hours.

'Research' this would involve the analysing of any documentation produced by the current system. It will give a good overview of what formats are used and the layout styles. This would be done within the organisation across multiple departments.

Turn over for the next question

15
15

Commentary

The better students scored highly on this question, as exemplified by this answer. For each technique, this candidate has answered the three requirements of the question with a relevant sentence for each. Weaker candidates lacked the required knowledge and understanding, particularly for observation and research.

QUESTION 6

Candidate 1

- 6 "Computer Based Training (CBT) is one method of providing training but is not suitable in all situations."

Discuss this statement.

(15 marks)

Computer Based Training or CBT is suitable for some companies but not for others.

Computer Based Training could refer to online ^{step by step} tutorials about particular software or a help feature ~~use~~ in accordance with the software package. It could also mean video tutorials on the Internet giving visual instructions on how to carry out a specific task.

CBT is popular for some companies as it is easily accessible as most organisations these days have access to the internet.

CBT is also popular for some as it means that another person doesn't have to take time away from their normal tasks to carry out the training. The individual can take their own pace to complete the training.

It also means that the organisation doesn't have to pay anyone; such as an external company to come in and conduct the training, or pay for the workers to go out of the office on a training day for example, covering travel expenses as well as the training fee etc.

However, CBT also has its disadvantages.

es.

for example, allowing the individual to work at their own pace means that some less-motivated individuals may not get the best out of their training and in fact be incapable of completing their jobs as they haven't finished their training on time or done it properly.

CBT also means that if the individuals find the task ^{they are learning} difficult, then they haven't got the option of ~~asking~~ being able to ask another member of staff for guidance. They may become frustrated and lose confidence in completing their proposed training.

Relying on the Internet connection for training can be difficult as for example, if ~~you~~ you were watching a video tutorial, a poor connection could mean you cannot watch it properly and so CBT becomes a more unreliable method for the company.

Reading step-by-step guides on the computer may ^{not} be the most useful method as with new versions of software being introduced all the time, they would need to be updated regularly so that they remained relevant and useful. Sometimes the information found on the internet isn't entirely reliable.

Turn over for the next question

14

14
15

Candidate 2

- 6 "Computer Based Training (CBT) is one method of providing training but is not suitable in all situations." **PLAN/**

Discuss this statement. Good Working with PCs Bad Lots of people (15 marks)
~~Quicker~~ More efficient New staff
 Costly

CBT is useful when training staff to work with new software or hardware, because they can immediately get used to it as they learn how to do various tasks and they can learn from any mistakes they may make.

However, it may not be so useful when training a great number of people, as they will often need individual support and attention from the instructor, which may result in an unlucky few not getting the attention they need, so they will not benefit as much from the training.

It may be more convenient for managers to train their staff in this way, as they can be left alone with the instructor to get used to the new software/hardware, which means managers can pay more attention to things such as the future of the organisation or financial issues.

However, it may not be very convenient for staff that are very inexperienced with computers, so they may struggle significantly even with simpler tasks. This means they may be unable

to use the system properly, so. This could result in mistakes being made, which could prove fatal to the organisation.

Also, it is not suitable if the organisation has a limited resource of finances, as CBT could be very expensive, especially if lots of staff need training. It would be an even larger drain on resources if very few staff actually benefit from it.

Turn over for the next question

2
15

Commentary

Candidate 1 demonstrates extensive knowledge and understanding, including advantages and disadvantages of this training method. An alternative approach taken by some candidates that also gained credit was to compare CBT with other methods of training.

Candidate 2's answer has scant and sometimes contradictory content, suggesting poor knowledge or understanding of CBT. For example, the second paragraph suggests that an instructor is present when staff are using CBT.

QUESTION 7

7 Explain, using examples, what the following types of systems can be used for:

- Management Information Systems
- Transaction Processing Systems
- Customer Relationship Management Systems.

(12 marks)

Management Information Systems are used to collect and gather ~~internet~~ data from other systems and present it in a way that is understandable to the user. The MIS will be linked with other systems and are mostly used to provide strategic level staff members ~~get~~ with information about business statistics. For example a MIS would be used if a manager wants to get an overview of the ~~last~~ days profits. To do this it would have to communicate with the Transaction Processing System to establish how many transactions have been completed.

Transaction Processing Systems are used to handle the everyday tasks of the organisation. This will cover all financial transactions, stock control and employee wages. This system will also read in information from systems to ~~be~~ form a complete transaction. For example this would be the ~~ordering of a~~ purchasing of a product by the customer via the EPOS system.

Customer Relationship Management ~~and~~ Systems will handle the relationship between the customer and the organisation. It will store data about the customer and make it available throughout the whole organisation, this means that the customer won't need to be 'bounced' around the company when placing a call. Also the CRM will store data about the customer's purchases so that advertisement features can be targeted towards specific customers. For example a customer who only buys books will not want to receive advertisements about clothing.

12
12

Turn over for the next question

Commentary

This candidate gained full marks. For each system type, four marking points have been identified. Note how credit has been given for Transaction Processing Systems and Transaction Processing (see the *Report on the Examination*).

Question 8 – Essay question and mark ranges used

“Client and user involvement is essential for any ICT development.”

Discuss this statement, making particular reference to the stages of development of a system and when and how clients and users need to be involved in the development.

Low mark range

Candidate uses relevant examples that correctly reference at least 1 stage. The candidate has used a form and style of writing that is barely appropriate for its purpose. The candidate has expressed simple ideas clearly but may be imprecise and awkward in dealing with complex or subtle concepts. Information or arguments may be of doubtful relevance or be obscurely presented. Errors in spelling, punctuation and grammar may be noticeable and intrusive to understanding, suggesting weaknesses in these areas. Text is barely legible.

0 – 5 marks

Medium mark range

Candidate uses relevant examples that correctly reference at least 2 stages. The candidate has used a form and style of writing which is sometimes appropriate for its purpose but with many deficiencies. The candidate has expressed straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well-connected. Information or arguments may sometimes stray from the point of information or may be weakly presented. There may be some errors of spelling, punctuation and grammar but not such as to cause problems in the reader's understanding and not such as to suggest a weakness in these areas. Text is legible.

6 – 10 marks

Good mark range

Candidate uses relevant examples that correctly reference at least 4 stages. Meaning is clear. The candidate has in the main used a form and style of writing appropriate for its purpose, with only occasional lapses. The candidate has expressed moderately complex ideas clearly and reasonably fluently. Candidate has used well-linked sentences and paragraphs. Information or arguments are generally relevant and well structured. There may be occasional errors of spelling, punctuation and grammar. Text is legible.

11 – 15 marks

High mark range

Candidate uses relevant examples that correctly reference all 6 stages. Meaning is clear. The candidate has selected and used a form and style of writing appropriate to purpose and has expressed complex ideas clearly and fluently. Sentences and paragraphs follow on from one another clearly and coherently. Specialist vocabulary has been used appropriately. There are few, if any, errors of spelling, punctuation and grammar. Text is legible.

16 – 20 marks

QUESTION 8

Candidate 1 – High Mark Range

8 “Client and user involvement is essential for any ICT development.”

Discuss this statement, making particular reference to the stages of development of a system and when and how clients and users need to be involved in the development.

In this question you will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

(20 marks)

This space is available for planning your answer, if you wish to use it.

analysis – client meetings.
 user interviews
 questionnaires.
 observation/research.
 design – agreed deliverables.
 build/construction –
 conversion –
 testing –
 review/maintenance –

Client and ~~user~~ user involvement is important at all stages of the development of a system.

At the analysis stage, it is essential that there is effective client and user involvement in the development. This is because the developer clearly needs to establish the requirements of their client in order that the ~~future~~ future system will be successful. The developer should participate in meetings with the client in order to understand what they want for their

company ~~from~~ from the system. At the same time, the developer needs to take into account the perspective of the user as after all, it is them who use the current system most and know it thoroughly and so will need to feel satisfied with the performance of the new one. The client and user involvement at this stage facilitates the systems developer with the knowledge and understanding to create a useful and efficient system, learning the current one, finding out about its inputs, outputs and processes for example and being able to implement those in the new system.

At the design stage, after researching the requirements, the developer should produce agreed deliverables for their customer or client, so that the client can make any changes to the design before it is created. This could be sections of the software as hand-drawn designs so the client can see what it will be like. Improvements made at the design stage thanks to user and client involvement mean that ultimately the system will be closer to the initial requirements.

After building and construction, at the stage

of implementation and conversion, the client should be very involved with the developer. During the conversion from the legacy system to the new system, problems are bound to arise. It is essential that these problems are improved on so that the company is comfortable with the new system completely.

Testing requires user involvement to ensure that the systems works as planned. The users, during ~~the~~ beta testing need to identify bugs for example so that their feedback enables the developer to make ~~changes~~ changes before giving the software to the client.

And finally, review and maintenance also rely on the client and user. The client needs to return to the developer and evaluate the system, describing how successful it was in matching their requirements. Through maintenance, after further use testing, the ^{system} developer can perfect, correct and adapt the new system, ensuring that it is satisfactory to the client and ~~the~~ ^{the} users and their customers.

18

18
20

Commentary for Candidate 1 – High Mark Range

This answer covers the required six development stages and shows a full understanding of the need for client and user involvement.

The candidate uses a maturity of language appropriate to the subject. For example, on Page 22 the sentence 'The client and user involvement at this stage facilitates the system developer with the knowledge and understanding to create a useful and efficient system...' demonstrates the required understanding. Similarly, the references to 'hand-drawn designs so the client can see what it will be like', encapsulates the essence of client and user involvement.

Throughout the essay there is an abundant use of appropriate subject specific language, spelling and grammar are accurate and the stages are logically organised.

However, the latter part of the essay was not quite as fluent or detailed as the preceding parts.

dyslexic etc. This helps the developer to create a system that covers all such possibilities, so the system will be easy to use for all users. This must be approved completely by the client before the developer can start constructing the solution.

In the Construction of the Solution Stage, the developer looks back at all the requirements of the client and how these are to be met, while also making sure what the client wants is possible to develop and what the agreed budget for the new system is. The client must give approval that it is exactly what they want before the developer can begin testing.

In the Testing Stage, the proposed system is tested with various kinds of data to ensure it allows possible ~~and~~ data and blocks impossible (erroneous) data. The client could be involved in the user testing as they are able to personally check that it is easy to use for them and all their users. It can be tested that the new system is able to cope under varying workloads and it can be used in a real life setting, including with any particular software or hardware

that the organisation might use.

In the Review and Maintenance stage, there are final checks to make sure the new system meets all requirements, any changes needed have been completed and verified by the client, and preferably that it has come within budget.

One crucial part of designing a new system is that client approval must be obtained at the end of each stage before the next stage can be started.

14
20

Commentary for Candidate 2 – Good Mark Range

A sound essay but some of the development stages are described in too much detail about issues not relevant to the required discussion. For example, reference to testing for erroneous data and using varying workloads is entirely correct but is not in context.

The level of client and user involvement described for each stage is both limited and repetitious, with 'approval' being emphasised throughout. The client and user involvement is only adequately discussed for four of the stages.

The spelling and grammar are acceptable but the essay's structure is disjointed.

QUESTION 8

Candidate 3 – Medium Mark Range

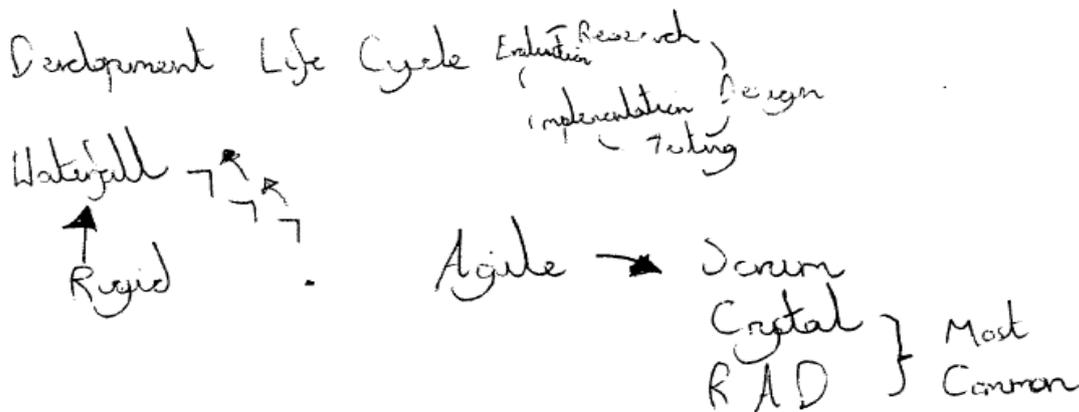
8 “Client and user involvement is essential for any ICT development.”

Discuss this statement, making particular reference to the stages of development of a system and when and how clients and users need to be involved in the development.

In this question you will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

(20 marks)

This space is available for planning your answer, if you wish to use it.



Client and User involvement is essential for an IT development as if they don't involve themselves they won't be getting what they want. If the user/client doesn't lay out a clear specification at the Research + Introduction the first stage then as the project moves through the cycle and becomes further away from what the client wants. Then when it comes to the evaluation stage and the analyst checks the system with the client against

the pre-prepared spec and it doesn't match up as the client wasn't including meaning an analyst will have to start over as the client won't have to pay for what they didn't want. User involvement is essential in the design phase as if certain users are less trained they will need simpler systems which the analyst will have to design the system accordingly. ~~As~~ This will be similar in the testing stage if development users will have to be able to use it making it a priority they are involved. If the system is for a small company and they are using an agile method user involvement would be more valuable as an analyst can say is this okay? No, and they change it accordingly and go back what about now? Yes it's fine. This is simpler here than in the waterfall method where there is little room for feedback and users almost take a back seat here.

For the Implementation stage all parties user, client and analyst will have to be involved to check the systems working everyone can use it okay etc. The final evaluation stage where a client can sit down with the analyst and here if it's wrong it can be changed but if a user/client

for marking

is involved at every stage then this is unlikely
to happen, this is why it is essential that involved
at every stage.

8
20

Commentary for Candidate 3 – Medium Mark Range

Different stages are mentioned but only two or three are discussed in any level of detail.

A significant proportion of the essay is concerned with the commercial issues surrounding payment for a developed system, whilst other relevant points have been omitted.

The link between stages is disjointed. The lack of paragraphs and the various spelling and grammatical errors confirm that the mark band is appropriate.

QUESTION 8

Candidate 4 - Low Mark Range

8 "Client and user involvement is essential for any ICT development."

Discuss this statement, making particular reference to the stages of development of a system and when and how clients and users need to be involved in the development.

In this question you will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

(20 marks)

This space is available for planning your answer, if you wish to use it.

..... Clients will need to be involved.....
..... in the ICT development of a system as.....
..... the client is the person the system is.....
..... aim for. They will need to ~~part~~.....
..... provide information to the user about.....
..... the design of the development in the system.....
..... they would like to have. This may.....
..... need the client and the user to.....
..... have some form of contact by.....
..... an interview or a questionnaire so.....

that the user will understand what they need to do. The client may provide ideas and explain what the system is needed for and the user will take notes and create an idea or a visual diagram of how this task will be done. The user is the person who will be using the system once they have formed an idea they may show the client for approval or any changes that need to be made or added. Once the client has given approval the user may carry out ways to create the system after analysis and design. They will start to put their paper ideas into practical form using a computer and implement the ideas. whilst carrying out the development the user should have a time-plan to not each task that is carried out on which particular day and time. they should also have equipments ready that will be needed such as printers, software, etc.

Turn over ▶

Commentary for Candidate 4 – Low Mark Range

Some stages are mentioned but not in sufficient detail and without adequate discussion of client and user involvement.

Poor spelling and lack of paragraphs further distract the reader from the content.