Cambridge TECHNICALS LEVEL 3

IT

Combined feedback on the January 2017 exam paper (including selected candidate answers and commentary)

Unit 1 – Fundamentals of IT

Version 2

Cambridge TECHNICALS

OCR
Oxford Cambridge and RSA

CONTENTS

INTRODUCTION

This resource brings together the questions from the June 2016 examined unit (Unit 1), the marking guidance, the examiners comments and the exemplar answers into one place for easy reference.

We have also included exemplar candidate answers with commentary for Questions 18 and 21a.

The marking guidance and the examiner's comments are taken from the Report to Centre for this question paper.

The Question Paper, Mark Scheme and the Report to Centre are available from:

https://interchange.ocr.org.uk/

GENERAL EXAMINER COMMENTS ON THE PAPER

This was the first sitting of this examination. Whilst some candidates had been prepared well, there was a significant knowledge gap for many candidates. This may have been due to not enough time spent teaching for this 90 GLH unit. It is essential that candidates have a sound understanding of the content of Fundamentals of IT, as this underpinning knowledge and understanding will be needed to study the optional units.

When preparing candidates for this unit, centres should use a wide variety of resources. No single resource will contain all the necessary learning to allow candidates to access the highest grades for this unit. Resources endorsed by OCR contain an introduction to some topics included in the specification. Additional materials and research will be needed to fully prepare candidates for this unit's summative assessment.

Candidates should be reminded that this is a technical qualification. As such, answers given should be technically correct and show a level of understanding greater than that of a lay-person.

Examination Technique

For the multiple choice questions, most candidates attempted each question. A small number of candidates did not answer all questions. Good examination technique would suggest that each question is attempted. Candidates could discount clearly incorrect answers to allow them to make a more informed choice from the distractors that remain.

A small number of candidates provided more than one answer to a single question. In these cases, the answer was marked as wrong. It is suggested that centres allow candidates to practice this style of question using the sample assessment material (and now this question paper) so they are familiar with answering multiple choice questions.

Some candidates provided answers outside of the answer box. Again, these answers were not credited as the requirement was to place a (✔) in the box next to the one correct answer for each question.

For Section B of the paper, the handwriting of some candidates made it difficult to understand what had been written. Where an examiner is unable to read an answer, no credit can be given. Centres should ensure candidates understand the need to ensure their answers are legible. In extreme cases, centres should consider whether a candidate would benefit from the use of a word processor for the summative assessment.

The answer space on the question paper would usually be sufficient for candidates to give their answer for all but the largest of handwriting. Candidates should resist the temptation to write more than is needed. Good examination technique requires candidates to use succinct statements to answer the given question.

Candidates should be reminded that Section B features a brief context. The context should be used in answering the question to allow full marks to be achieved.

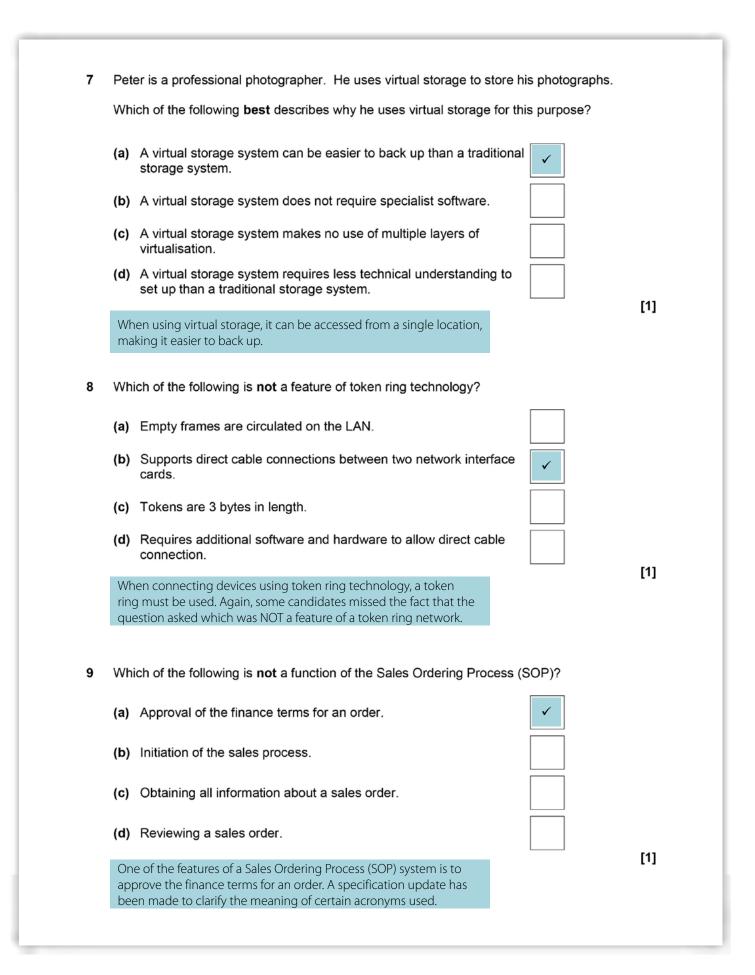**Resources which might help address the examiner comments:**

From the link below, you'll find 'The OCR guide to examinations' (along with many other skills guides)
http://www.ocr.org.uk/i-want-to/skills-guides/

Command verbs definitions
http://www.ocr.org.uk/Images/273311-command-verbs-definitions.pdf

Section A

Answer **all** the questions.

Section A

Put a tick (✓) in the box next to the **one** correct answer for each question.

1   Which of the following is a function of a modem?

   (a)   Authenticates user logons.

   (b)   Connects together two virtual networks.

   (c)   Controls the flow of data around a network.

   (d)   Converts digital signals into analogue signals.   ✓

[1]

A modem converts digital signals to analogue signals and back again.

2   RagNar Technologies uses cloud storage.

Which of the following is **not** a characteristic of cloud storage?

   (a)   Can be off premises or on premises storage.

   (b)   Data storage is outsourced by RagNar Technologies.

   (c)   Data may travel over an increased number of networks.

   (d)   Increases energy consumption by RagNar Technologies.   ✓

Cloud storage is the use of servers, often hosted by a third party, and accessed using the Internet (the cloud). Some candidates missed that this question asked which of the answers was NOT a feature.

3   Which of the following explains why an organisation may choose to use fibre optic technology rather than copper wire technology as part of its network?

   (a)   Fibre optic networks are cheaper to create.

   (b)   Fibre optic networks do not require network switches.

   (c)   Fibre optic signals cannot be affected by electromagnetic interference.   ✓

   (d)   Fibre optic signals suffer from more attenuation.

[1]

One of the benefits of using fibre optic technology in networking is that fibre optic signals are not affected by electromagnetic interference as much as an electrical connection.

4   Which of the following is a function of a wireless access point?

   (a)   Converts data into binary format.

   (b)   Converts data into digital format.

   (c)   Provides a bridging capacity between wireless and wired
         networks. ✓

   (d)   Scans for wired devices within range.

   [1]

   A wireless access point is used by a wireless device to access a
   wireless network which can in turn provide access to a wired network.

5   Convert the decimal number 187 to 8-bit binary.

   (a)   1011 1011 ✓

   (b)   1110 1100

   (c)   1011 1101

   (d)   0011 0010

   [1]

   It was pleasing to see that candidates were able to correctly convert
   between binary and decimal.

6   Convert the hexadecimal number 77 to decimal.

   (a)   119 ✓

   (b)   7

   (c)   112

   (d)   191

   Many candidates sensibly first converted the number to binary and
   then converted the binary number to decimal.

   [1]

7   Peter is a professional photographer. He uses virtual storage to store his photographs.

Which of the following **best** describes why he uses virtual storage for this purpose?

(a)   A virtual storage system can be easier to back up than a traditional storage system.   ✓

(b)   A virtual storage system does not require specialist software.   ☐

(c)   A virtual storage system makes no use of multiple layers of virtualisation.   ☐

(d)   A virtual storage system requires less technical understanding to set up than a traditional storage system.   ☐

[1]

When using virtual storage, it can be accessed from a single location, making it easier to back up.

8   Which of the following is **not** a feature of token ring technology?

(a)   Empty frames are circulated on the LAN.   ☐

(b)   Supports direct cable connections between two network interface cards.   ✓

(c)   Tokens are 3 bytes in length.   ☐

(d)   Requires additional software and hardware to allow direct cable connection.   ☐

[1]

When connecting devices using token ring technology, a token ring must be used. Again, some candidates missed the fact that the question asked which was NOT a feature of a token ring network.

9   Which of the following is **not** a function of the Sales Ordering Process (SOP)?

(a)   Approval of the finance terms for an order.   ✓

(b)   Initiation of the sales process.   ☐

(c)   Obtaining all information about a sales order.   ☐

(d)   Reviewing a sales order.   ☐

[1]

One of the features of a Sales Ordering Process (SOP) system is to approve the finance terms for an order. A specification update has been made to clarify the meaning of certain acronyms used.

10 Which of the following is **not** an example of staying safe online?

(a) Preventing web browsers from remembering login details. ☐

(b) Withholding personal details from a chat room. ☐

(c) Leaving security settings at default public level. ☑

(d) Using a password that includes numbers, text and symbols when using online banking. ☐

[1]

> When using the Internet, personal security settings and privacy settings should be modified to meet the needs of the user.

11 Ever-Brook surgery has a Health and Safety policy that all staff must sign when they start working for the organisation.

Which of the following would **not** be included in a Health and Safety policy?

(a) Advice on how to avoid injury when using computer equipment. ☐

(b) Advice on how to maintain equipment. ☐

(c) Advice on how to maintain fitness levels. ☑

(d) Advice on who to contact with a question. ☐

[1]

> A company's Health and Safety policy would not include information on how to maintain fitness levels.

12 Maggie has been told that she needs to update the antivirus software on her computer.

Which of the following **best** describes a computer virus?

(a) An infected file. ☐

(b) An attempt to steal data from a user's computer. ☐

(c) An attempt to deny user access to a computer system. ☐

(d) A self-replicating file that installs without the consent of the computer owner. ☑

[1]

> A computer virus is a self-replicating file that installs without the consent of the computer owner. A small number of candidates stated that a computer virus was an infected file. This was not the best answer to this question.

13   Which of the following items are part of a hypervisor server system?

(a)   A guest machine running a series of virtual operating systems. ☐

(b)   A host machine and a guest machine. ☑

(c)   A host machine and a super-host machine. ☐

(d)   A sub-host machine and a super-host machine. ☐

[1]

Components of a hypervisor system include a host machine and a guest machine.

14   QTE sends staff a monthly payslip by email. Which of the following reasons **best** describes why the payslip is encrypted?

(a)   So that the email cannot be intercepted. ☐

(b)   So that the employee knows the email is genuine. ☐

(c)   So that the payslip may not be read if intercepted. ☑

(d)   So that the sender gets a read receipt when the email is opened. ☐

[1]

Encryption scrambles the contents of a file so that it can't be read unless it is decrypted. Most candidates were able to correctly answer this question.

15   Which of the following pieces of legislation applies to the safe disposal of electronic equipment?

(a)   The Computer Misuse Act (1990). ☐

(b)   The Sale of Goods Act (1979). ☐

(c)   Hazardous Waste (England and Wales) Regulations (2005). ☐

(d)   The Waste Electrical and Electronic Equipment Regulations (2013). ☑

[1]

The Waste Electrical and Electronic Equipment Regulations (2013) applies to the safe disposal of electronic equipment.

Section B

Section B

Progress Gaming produces video games for smartphones, games consoles and personal computers. Customers can play games, individually or with a friend, on multiple devices using peer to peer technology.

Games are developed using an off the shelf programming package, with all storage being cloud based.

Progress Gaming has a web site that is used to purchase and download games. It also gives details on how customers can get technical support using instant messaging, email and telephone.

16 Progress Gaming uses a number of digital security measures to protect its infrastructure.

Explain why Progress Gaming would use the following digital security measures:

Up to two marks for each of two explanations.
e.g.

Firewall:

- Stop unauthorised packets/data (1) from accessing their network (1).
- Filter traffic (1) to prevent unauthorised access (1).
- Any other valid suggestion.

Anti-spyware:

- Prevent spyware (1) from being installed on a computer (1).
- To detect spyware (1) before it is able to be installed on their devices (1)
- Any other valid suggestion.

[4]

Mark Scheme Guidance

Firewall stops people/hackers (max 1) as the candidate is not showing true technical understanding of what firewall does.

Examiner comments

Few candidates were able to score full marks for this question. Candidates frequently stated that a firewall is used to stop hackers. At this level, technical answers, such as inspecting data packets and only allowing authorised packets through are more acceptable answers. Similarly, candidates frequently stated that anti-spyware software would be used to stop hackers. Again, this is not technically correct.

17 Progress Gaming uses cloud based storage to store all of its data.

Explain **two** advantages and **one** disadvantage of using cloud based storage.

Up to two marks for each of two explanations.
e.g.

Advantage 1 ....

- If a fire/flood/other disaster happens in the office (1) data is held elsewhere so no loss of productivity (1).
- Easy to work from home/remotely (1) as data is independent of location (1).
- (Progress Gaming) can increase their storage capacity (1) without having to wait for equipment to arrive (1).
- Reduced hardware costs (1) as physical storage does not need to be purchased (1).
- Back-ups do not need to be taken (1) as the cloud provider does this for you (1).
- Any other valid suggestion.

Disadvantage ....

- If you have not internet connection/slow internet connection (1) you can't do any work as data is no longer on site (1).
- Data may be accessible by cloud storage company (1) which could be a risk for Progress Gaming (1).
- Progress Games do not have full control over their data (1) as it is now held by another company (1).
- Any other valid suggestion.

[6]

Mark Scheme Guidance

Advantages/disadvantages can be from any view point.
Do not award the same expansion for different advantages/disadvantage.

Examiner comments

Most candidates were able to identify at least one advantage of cloud based storage. Often, answers included the fact that data was stored remotely, which would allow staff to work from remote locations. A disadvantage of cloud based storage was often more difficult for candidates to recall.

18   Progress Gaming needs to hire new programmers to help develop its games.

(a)* Discuss, using examples, key skills the new programmers should have.

Indicative content e.g.
- **Competence with programming environment:** so they can program the games. Example so if creating a component of a game when the game is constructed everything 'fits' together.
- **Ability to write code in relevant language:** so that they can develop the games.
- **Logical mind:** so are able to solve problems. Example – creating a patch for a game if errors have been found.
- **Well organised:** so can keep track of tasks. Example prioritisation of tasks to ensure all tasks are completed in a timely manner.
- **Good interpersonal skills:** so they can work with the rest of the programming team without alienating their colleagues'.

(b) Progress Gaming has decided to use a teleconference to interview new programmers.

Explain **two** disadvantages of using a teleconference to interview new programmers.

- Up to two marks for each of two explanations.
  e.g.
- If the teleconference fails/poor phone connection (1) interview can't progress (1).
- Can't share/view documents (1) as there is only an audio line (1).
- Can't see the programmer (1) so won't pick up on body language/won't know if they are suitably dressed (1).
- Don't get to meet the programmer (1) don't know if they will fit in (1).
- Cannot confirm identification of interviewee (1) as they cannot be seen (1).
- Any other valid suggestion.

[4]

(c) Progress Gaming wants the new programmers to be a member of a professional body.

Describe **one** benefit of new programmers being a member of a professional body.

Up to three marks for description.
e.g.
- Progress gaming can be confident (1) that the programmer has a certain degree of experience/ competency (1) that is relevant to the industry (1).
- Programmer has access to network of resources (1) such as other experts (1) to help with technical issues (1).
- Continuing professional development (1) which is accredited by the professional body (1) to ensure skills are up to date (1).
- Any other valid suggestion.

....

....

....

....

....

...................................**[3]**

Mark Scheme Guidance

18 (a)

7-10	3	Has shown a detailed level of understanding by discussing more than one key skills a new programmer should have.
		Relevant examples will be used to support discussion and ideas will be expressed clearly and fluently.
		There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.
4-6	2	Has shown a good level of understanding by explaining at least one key skill a new programmer should have.
		Some example(s) will be used to support explanations which may not be relevant and may at times detract from fluency of narrative.
		At the bottom of the mark band the learner may have described a single skill.
		There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.
1-3	1	Has identified points relevant to the key skills a new programmer should have.
		Limited use of examples to accompany description and ideas will be poorly expressed.
		At the bottom of the mark band, a single skill may be identified without an example.
		The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.
0		Nothing worthy of credit.

18 (b)

Two marks for each full explanation.

Must be a realistic disadvantage of using a teleconference (voice only).

Examiner comments

18 (a)

This question asked candidate to discuss with examples, key skills a programmer should have when working for the company. It was marked using a level of response marking scheme. To answer the question correctly, candidates should use the command word, 'discuss' in this case to provide a reasoned and well written response to the question given. Marks were also awarded for the quality of the extended response. To achieve full marks, candidates should discuss more than one key skill a programmer would need, giving detailed examples, related to the context. The response given should be well structured (i.e. not jump around) and not contain factually incorrect information. Many candidates were able to score in the middle mark band with a few moving to the top mark band. A small number of centres appear to have failed to study this area of the specification.

18 (b)

This question asked for two disadvantages of using a teleconference to interview new programmers. Some candidates mistakenly believed that a teleconference included video or that the Internet was needed. This showed a lack of understanding of the specification. Poor examination technique meant that a small number of candidates gave two answers based on a single disadvantage.

18 (c)

Candidates were asked to describe a single benefit of programmers being a member of a professional body. Whilst some candidates clearly understood the purpose of a professional body and were able to describe a benefit in context, again, lack of coverage of specification topics meant that a number of candidates were unable to answer this question.

Exemplar candidate work

Question 18 - Low level answer

18   Progress Gaming needs to hire new programmers to help develop its games.

(a)* Discuss, using examples, key skills the new programmers should have.

The new Programmers would have to have an understanding of how to Program and would have to understand how game scripting works.

The Programers will have to show Progress Gaming a history/evidence to show Prove that they have Programed before. They could even show them a Portfolio.

Another Key skill the Programmers should have is an understanding of the software that is used for Programming the games. This is important because depending on the software used, would determind if the Programmer new how to understand and read it, to then write new code.

Also the Programmers should be used to working on different Operating systems because if the Company used windows and the Programmer used mac os, the Programmer might learn code that is only on Mac & not windows and that could make it difficult for the company to hire the right Programmer.

overall the new Programmer should have a basic understanding of Programming and should know how to script games. Also they should have an interest in Programming games so they are Passionate about and they will do their best for it.

[10]

(b) Progress Gaming has decided to use a teleconference to interview new programmers.

Explain **two** disadvantages of using a teleconference to interview new programmers.

1. depending on internet speed the quality for the video will be Poor, this will affect the interview and might affect the chances of you getting the job.

2. Not everyone has a webcam/front camera so the new Programmer might not be able to show himself

[4]

Describe **one** benefit of new programmers being a member of a professional body.

One benefit of this would be it will improve the Programmers attitude and punctuality towards their work and it will make them a better Person.

[3]

Commentary

Q18a. In paragraph 1, the candidate has identified key skills the programmers should have. Paragraph 2 contains nothing worthy of credit. In Paragraph 3, the candidate tell us that the programmer must understand the software used to program the games. Again, this is simply identifying a skill, but very superficially. In the next paragraph, they again identify the same skill, with a final conclusion saying the same thing.

As the candidate has identified two weak skills, a mark in mark band 1 is appropriate. The examples given are limited and their ideas are poorly expressed. As 1 mark is available for giving a single skill and this candidate has done more than that, best fit would suggest 2 marks.

To improve this response and move to mark band 2, the candidate should develop their response further to include a description (with example), or for the top of the mark band, an explanation with example.

An example response at the top of mark band 2 could be as follows:-

One skill the new programmer should have is the ability to program in the language used by Progress Gaming. By already being able to program in the same language, the programmer will be able to start developing code straight away without having to learn a new programming language. This will make the programmer much more productive.

Q18b. The candidate provided a single disadvantage to using a teleconference by stating that the speed of the internet will affect the video quality, and that not everyone has a web cam. Neither of these are correct answers. A teleconference is an audio only conference and so video does not feature at all. The candidate shows a lack of knowledge of specification content in their response.

Q18c. The candidate response suggests that the role of a professional body is to improve the programmers attitude and punctuality towards their work. Again, lack of knowledge of the purpose of a professional body mean that this answer is incorrect.

Exemplar candidate work

Question 18 – medium level answer

18 Progress Gaming needs to hire new programmers to help develop its games.

(a)* Discuss, using examples, key skills the new programmers should have.

A new programmer should have good knowledge and new ideas to develop or create a new game so have a idea of a completely new/different game or/and use good/positive ideas in games today. The programmer would also need self confidence so he needs to believe that the game is a good idea and it will work he should not give up so will need a positive attitude to work.

He would also need good problem solving so if there is and problem in his game he would need to solve it and outcome the problem.

He will need good leadership as he might be working in a team and might need to motivate others.

If he works in a team he will need very good listening and communication skills, so listen to others ideas and think if they are good and he will need communication to share his ideas, this helps his ability to work well in a team.

The programmer will need good organisation skill so they need to make sure what they are doing and when.

Programmer also need good time management so not take to work and don't spend to long on a single task.

Verbal and non-verbal communication so tone of voice or body language can represent a view of a idea.

(b) Progress Gaming has decided to use a teleconference to interview new programmers.

Explain **two** disadvantages of using a teleconference to interview new programmers.

1 they may not be able to connect to some of the new Programmers due to problems with wifi ~~or~~ ✗.

2 They will not be able to see how the new Programmer reacts to their working environment.

[4]

(c) Progress Gaming wants the new programmers to be a member of a professional body.

Describe **one** benefit of new programmers being a member of a professional body.

If they are a proffessional body, they are likely to already have a good knowledge of a programmer therefore this means they are already trained and progress gaming will not need to spend money on training which will be very helpful for them.

[3]

⟨10⟩

Commentary

Q18a. The candidate has listed a number of skills, each with some description although the examples given are weak. An attempt at explaining key skills a programmer should have is also made, but the explanation is weak.

The answer given fits the criteria for mark band 2. The explanation is weak and the examples given are again weak so the top of the mark band is not suitable. The candidate has provided more than a single description with example though, so best fit suggests 5 marks.

To move to the top mark band, the candidate should discuss more than one key skill a new programmer should have. They could expand on their leadership answer to say why being able to lead other programmer is important and then discuss the impact of taking a leadership role would have on the development of the code. Answers that show depth of understanding move the response to the top mark band.

An example of an expanded answer (more than one would be needed for the top mark band) would be as follows:-

'Programmers should be well organised (skill identified). This will allow them to priorities the code they had to develop for the game (example given) to ensure that all parts of the game were developed in the correct order (point) and that no parts of the game were missed out (expansion) They would also then ensure that they weren't affecting the delivery timescales of the game by missing out a key piece of the code that they were assigned (depth of understanding)

Q18b. Answer one is incorrect. WiFi is not needed for a teleconference. In answer two, the candidate has described a single disadvantage, that Progress Gaming would not be able to see how the new programmer would react to the working environment. This answer was given benefit of doubt, as although technically correct, it is a weak disadvantage that does loosely fit the 4th marking point on the mark scheme.

To gain full marks, the candidate could have stated that a teleconference makes it impossible to pick up on body language as the programming is not able to be seen. This would be worth two additional marks.

Q18c. This response identifies training that the programmer will have had. In order to be a member of a professional body, members must be competent and trained to a certain level. The response given was worthy of one mark.

To score full marks, the candidate could have stated that the training received would be relevant to the industry and so Progress Gaming could be confident that the programmer would have the necessary skills.

Exemplar candidate work

Question 18 – high level answer

18 Progress Gaming needs to hire new programmers to help develop its games.

(a)* Discuss, using examples, key skills the new programmers should have.

Firstly, a new programmer should have good problem solving skills. When they are experimenting with different codes for new games, they are likely to encounter problems. Therefore Progress Gaming should look for the ones that can efficiently solve the issues, as this will increase their productivity and allow them to stick to deadlines.

Also, time management skills are important. If Progress IT Gaming hires a new programmer who is able to follow deadlines, the quality of their the company's services will improve, ultimately leading to greater profits. Like with all companies, wasting time can cost them a lot of money, so an on-task, well organised programmer will be ideal for Progress Gaming.

Furthermore, the programmers need to have of leadership skills. There may be a particular area of coding that they excel in, so Progress Gaming may ask them to lead a team of workers to on a project. To lead efficiently, they should know their team's strengths, set realistic targets (in terms of work and the deadlines) and take responsibility for ensuring the team is productive. The ability to lead will be helpful for Progress Gaming, because more will be soon completed if their workers have direction and goals to achieve, with somebody encouraging them to get there.

Another important skill is team working teamwork. As part of a game development company, there will be several other programmers assigned to the same task. The ability to listen to the other employees, help them on complex tasks and generally be friendly with them will increase the productivity of Progress Gaming.

In addition, communication skills are very important. The programmer must be able to get across their point of view and any ideas they have, else it will go to waste. They should also have a decent understanding of English, and be able to write legible documents for their peers and superiors. A good level of communication will ensure others understand how to work on a task, as well as any concerns the employee may have.

Moreover, a programmer should be creative. Progress Gaming will employ them not only to maintain existing games, but also to find new ways create new games that will excite players. This skill may help them take a more leading role, making Progress Gaming more successful compared to competitors.

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[10]

(b) Progress Gaming has decided to use a teleconference to interview new programmers.

Explain **two** disadvantages of using a teleconference to interview new programmers.

1 You cannot get first impressions from new programmers by listening to their voice as in a face to face interview you can get first impressions on how they act and dress

2 Results may be biased as the person on the other end may be looking at something to help him. This is prevented in a face to face interview.

[4] 4

(c) Progress Gaming wants the new programmers to be a member of a professional body.

Describe **one** benefit of new programmers being a member of a professional body.

The professional body ensures the standard of the programmers work is high. This usually is inspected every year, ensuring their standards don't slip and they provide their company will reliable and high quality quality work. It will be one of the expectations of the professional body.

[3]

(15)

Commentary

Q18a. This candidate has provided an answer with a number of skills, each featuring relevant examples and well explained. It is worth full marks.

Q18b. This candidate has scored full marks. Their first response starts off poorly, but their further explanation makes it clear that the disadvantage is that you can't see them, so are unsure of how they dress.

Q18c. This response scores 2 marks. The candidate states that by the programmer being a member of a professional body, Progress Gaming can be sure that the programmer meets a set standard. To gain the final mark, the candidate could state that the professional body would provide continued professional development to ensure the programmer maintains the standard. The candidate appears to suggest this in the answer given, but it wasn't presented in sufficient detail to be awarded the final mark.

19 Programmers at Progress Gaming use a change management process throughout the development lifecycle.

Evaluate the use of a change management process at Progress Gaming.

- Indicative content:
- Advantages/disadvantages of a change management process at Progress Games.
  e.g.

Advantages
- Reduces the likelihood of things going wrong during development.
- Creates a clear log of changes/improvements made.
- Allows changes to be approved.
- Formalises a process/sets clear rules for changes.

Disadvantages
- Can introduce complexity in programming practice.
- Can reduce responsiveness of developers if all things have to go through process.
- Can be difficult to implement successfully.
- Needs everyone to follow the process.
- Any other valid suggestion.

Mark Scheme Guidance

5-7	3	The learner has evaluated the use of a change management process at Progress Games. Both advantage(s) **and** disadvantage(s) have been analysed and learner is able to make informed and appropriate judgements within the context provided. An implied conclusion is present which is informed by the supporting analysis. Subject specific terminology and knowledge will be clearly used to support and inform the explanations/evaluations. There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.
3-4	2	The learner has described reasons for or against the use of a change management process at Progress Games. Advantage(s) **and/or** disadvantage(s) have been described and learner is able to make some judgements within the context provided. Some subject specific terminology and knowledge will be used. There is a line of reasoning presented with some structure. The information presented is for the most part relevant and supported by some evidence.
1-2	1	The learner has identified points about the use of a change management process at Progress Games. At the bottom of the mark band, the learner may have simply provided a single point. Subject specific terminology may be limited or missing. The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.
0		Nothing worthy of credit.

Examiner comments

This question required candidates to evaluate a change management process. Few candidates were able to correctly answer this question. The most common incorrect answer included points relating to frequently changing the manager of the team. Again, lack of coverage of the specification meant that candidates scored poorly on this question. It is essential that sufficient time is given to deliver the whole specification, using resources from a variety of sources prior to entering candidates for the summative examination.

20 Progress Gaming uses a standard troubleshooting process. The steps of the process are listed below.

Place the steps in the most suitable order by writing the letter corresponding to the step in the column on the right. The first two have been completed for you.

A — Define theory of possible cause

B — Create plan of action

C — Identify problem

D — Test theory

E — Start

F — Document results

G — End

H — Verify problem solved

E

C

For six marks:

A (1)	A (1)
D (1)	B (1)
B (1)	D (1)
H (1)	H (1)
F (1)	F (1)
G (1)	F (1)

[6]

Mark Scheme Guidance

These are the only two possibilities.

Examiner comments

This question required candidates to put the steps from the troubleshooting process in the correct order. Many candidates were able to do this. Troubleshooting methodologies are a specification item.

21 Progress Gaming uses an off the shelf operating system for its servers and personal computers.

(a) Compare the use of an off the shelf operating system with an open source operating system.

Comparison of an off the shelf operating system with an open source operating system.

4	Two complete comparisons
3	One complete comparison and one individual point
2	One complete comparison
1	One individual point about either side
0	Nothing worthy of credit

e.g.
- Purchase price of off the shelf system is usually more expensive to purchase than open source whereas open source purchase cost is often small.
- On-going support for off the shelf comes from manufacturer. Open source often relies on support from internet/developer/enthusiasts.
- Off the shelf operating systems mean staff will usually be more familiar with it, open source product staff may not have seen before.
- Open source operating systems can have its source code edited whilst off the shelf operating systems are maintained by the manufacturer.
- Any other valid suggestion.

[4]

(b) Identify **one** other type of operating system and explain how Progress Gaming could use it.

Operating system type...

....

How it could be used ....

One mark for identifying alternative type of operating system and up to **three** marks for explanation.
- <u>Bespoke/Custom</u> (1st) would be custom designed for Progress Games (1) and would only have the features they needed (1) so would perform faster (1).
- <u>Multiprocessor</u> (1st) uses more than one CPU at the same time (1) which results in faster processing (1) which would make sure games compile faster (1).
- <u>Single user</u> (1st) where higher performance is needed (1) computer resources not shared by other users (1) so games could compile faster (1).
- <u>Multi user</u> (1st) resources could be shared between users (1) to make more effective use of hardware/software (1) making the company more efficient (1).
- <u>Single processor</u> (1st) non-critical tasks (1) could be performed using cheaper hardware (1) saving the company money (1).

Mark Scheme Guidance

21 (a)

If the point is the same / different for both then the candidate must explain why it is for both to gain marks for both.

Do not accept open source is free.

The use of "isn't" within the answer does not create a comparison.

The use of "whereas" within the answer does however allow create a comparison.

21 (b)

Do not accept Off the Shelf Operating System or Open source Operating System as in question 7a and the question asks for other operating systems.

The operating systems listed are the only ones mentioned in the specification.

Examiner comments

21 (a)

This question required candidates to compare the use of an off the shelf and an open source operating system. To gain full marks, candidates should give a complete comparison of multiple points. An example of a complete comparison would be 'Off the shelf software has support provided by the manufacturer, whereas open source support often relies on enthusiasts, or the original developer of the code. A common misunderstanding was that open source software is free.

21 (b)

Many candidates were able to give one other type of operating system and explain how it could be used. The most frequent response was bespoke operating system. Some candidates gave 'closed source' which was not awarded any marks.

Exemplar candidate work

Question 21a - low level answer

> 21 Progress Gaming uses an off the shelf operating system for its servers and personal computers.
>
> (a) Compare the use of an off the shelf operating system with an open source operating system.
>
> Off the shelf will be used when progress gaming dosent require the opedating system to do something specific for them.
>
> open source can be used so that they can build it to do what they require
>
> [4]

Commentary

This candidate has started to form an answer that, if expanded, could be considered as correct. Unfortunately, the response is too vague to be worthy of a mark. The candidate tells us that an off the shelf operating system will be used when progress gaming doesn't require the operating system to do something specific for them.

The second paragraph goes on to state that open source software can be used so that they can build it do what they require. (The hand writing is problematic for this candidate, which makes it difficult to fully understand what the candidate is saying.) Again, the second paragraph is too vague.

If the candidate had expanded the answer to state that an off the shelf operating system doesn't provide access to the source code, and so can't be edited to provide specific features for progress gaming, the answer would be worthy of a mark. If the candidate had extended their answer to go on to say an open source operating system provides access to the source code so specific features can be coded, this would be a complete comparison and would be worth 2 marks.

In this response, the candidate has provided a single comparison, so the maximum mark possible would be 2 marks. To gain the additional 2 marks, the candidate must provide an additional comparison.

Exemplar candidate work

Question 21a - medium level answer

21 Progress Gaming uses an off the shelf operating system for its servers and personal computers.

(a) Compare the use of an off the shelf operating system with an open source operating system.

OFF the shelf software is created for a large audience. Its features will apply to the general public and they will sell a large quantity at a low price. It will have a working customer service and regular updates. Open source software allows anyone to look at the source code and modifications can be made. Open source software may not have a customer service.

[4]

Commentary

This candidate has provided a number of points about the operating system types, but has not made a complete comparison. For this style of question, the maximum mark available is 1 mark if a complete comparison has not been made.

In the response, the first two sentences are not technically correct and are not considered.

'It will have a working customer service' is too vague as it is not explained, although a point could be considered for regular updates.

A mark is given for *'open source software allows anyone to look at the source code and modifications can be made'*.

'Open source may not have customer service' is too vague and so is not considered as a comparison.

Overall, the points presented are only worth 1 mark.

If the candidate had given more detail in regards to the customer service points, then a complete comparison may have been made.

For example, *'open source software is often developed by independent programmers who may not be able to provide timely customer service to customers, whereas off the shelf software is often sold by companies who provide customer service to customers who experience problems with their software.'*

Exemplar candidate work

Question 21a - high level answer

21 Progress Gaming uses an off the shelf operating system for its servers and personal computers.

(a) Compare the use of an off the shelf operating system with an open source operating system.

This is a candidate style answer

Off the shelf software does not provide access to the source code and so cannot be customised for Progress Gaming, whereas open source sofware provides access to the source code and so can be edited to suit the needs of PG.

Staff will usually have seen off the shelf software before as it is common on a lot of computers, whereas open source software isnt as widely used so they may not be familiar with how to use it.

[4]

Commentary

The candidate has provided two complete comparisons, each of which are worth 2 marks. They have clearly compared access to source code, and familiarity with the end product.

22 Smartphone games can be played on multiple devices using peer to peer technology.

(a) Explain **two** reasons why peer to peer technology would be used.

1 .....

Up to two marks for each of two explanations.
e.g.
- Simpler for end user to set up (1) as no server needed (1).
- No additional hardware/router/switch (1) as Bluetooth/Wifi communicates directly with other device (1).
- No account/login details/password needed (1) which makes setup quicker (1).

2 .....

- Any other valid suggestion.

[4]

(b) Identify and describe **one** other method that could be used to allow games to be played on multiple devices.

Method ....

How it allows games to be played on multiple devices ....

One mark for identifying alternative method and up to two marks for description.
- Client server (1st)
  - Where central server (1) facilitates game play (1).
  - Game can be streamed (1) from central server (1).
  - Increases the number of possible participants (1) due to high performance capability/capacity (1).
  - Any other valid suggestion.

[3]

Mark Scheme Guidance

22 (a)

This question is concerned with the setting up of the game and not the playing of the game.

22 (b)

Do not accept answers relating to peer to peer technology.

Correct answer only for first mark but there can be a variety of expansion points.

Examiner comments

22 (a)

Most candidates were able to score at least two marks for this question, explaining at least one advantage of using peer to peer technology to play games on multiple devices. A significant number of candidates ignored the context of this question, and gave responses explaining why peer to peer file sharing would be used. Again, poor examination technique prevented some candidates from gaining full marks.

22 (b)

A small number of candidates answered this question well. Those that answered client server technology were then able to describe how the technology could be used.

23* Explain why Progress Gaming would use both a database server and an application server.

Indicative content:
Reasons for using both a database server and an application server.
e.g.
Database server
- Database server used to run database software.
- Much more scalable.
- Increased reliability.
- Store data (employee/user/messages/chat/purchases).

Application server
- Application server used to run application from.
- Two different purposes.
- Simplified updates are just needed on the application server instead of each machine.
- Provides the front end to the database data.
- Installers can be found on here.

Combined
- Both needed to allow scalable data processing and applications to be delivered to staff efficiently.
- Keep data and application separate in order to use the same data in different applications / in order to keep data more secure.
- Application can be upgraded/updated without affecting the underlying data.
- Data can be kept in a different physical location to the application, increasing the security.
- Any other valid suggestion.

Mark Scheme Guidance

7-10	3	The learner has explained the purpose of a database **and** an application server. The learner has also provided an explanation of reason(s) why **both** would be used in the context provided. Subject specific terminology and knowledge will be clearly used to support and inform the explanations. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.*
4-6	2	The learner has described the purpose of a database **and/or** application server. The learner has also provided a description of why **either** would be used, for the most part linking their answer to the context provided. At the bottom of the mark band, the learner may describe just the purpose of a database or application server. Some subject specific terminology and knowledge will be used. *There is a line of reasoning presented with some structure. The information presented is for the most part relevant and supported by some evidence.*
1-3	1	The learner has identified points about a database **and/or** application server. At the bottom of the mark band, a single point about either server type may be given. Subject specific terminology may be limited or missing. *The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.*
0		Nothing worthy of credit.

Examiner comments

Whilst many candidates were able to correctly describe the purpose of both an application and database server, few were able to explain why both would be used. Again, lack of time covering specification content, or failing to cover the content in sufficient depth prevented many candidates from scoring well on this question.

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