Pearson BTEC Level 3 Nationals Certificate, Extended Certificate, Foundation Diploma, Diploma, Extended Diploma

Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Learner Registration Number

Time 1 hour 45 minutes

Paper reference **31769H**

Computing

UNIT 2: Fundamentals of Computer Systems

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- You may use a calculator.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Answer ALL questions. Write your answers in the spaces provided.

1 Martina is building a new desktop PC.

(a) Martina has decided to use a Solid State Drive (SSD) in her new computer.

Give **three** reasons why an SSD would mean her computer would perform better than if she used a hard disc drive (HDD).

(3)

1 .....

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2 .....

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3 .....

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(b) Martina installs random access memory (RAM) in her new PC.

Describe the purpose of RAM.

(2)

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(c) A characteristic of RAM is that it is volatile.

Explain what is meant by volatile memory.

(2)

(d) Martina installs a graphics card (GPU) and downloads the latest device drivers.

Give **three** reasons why device drivers are needed.

(3)

1 .....

2 .....

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(e) Martina often has many programs open at the same time when working.

The OS kernel is responsible for multitasking.

Describe how the kernel controls multitasking.

(3)

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(f) The computer's CPU and its registers are used during the fetch-execute cycle.

Describe the purpose of the Memory Address Register (MAR) and the Memory Data Register (MDR) in the fetch-execute cycle.

(4)

MAR

MDR

(g) Multi-functional devices use the stored program model.

Explain why the stored program model is appropriate for multi-functional devices.

(3)

(Total for Question 1 = 20 marks)

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QUESTION 2 BEGINS ON THE NEXT PAGE

2 Peter owns a tech company that has just launched a new cloud gaming platform. The platform will be accessible to users all over the world.

Figure 1 is a diagram of how users access the platform.

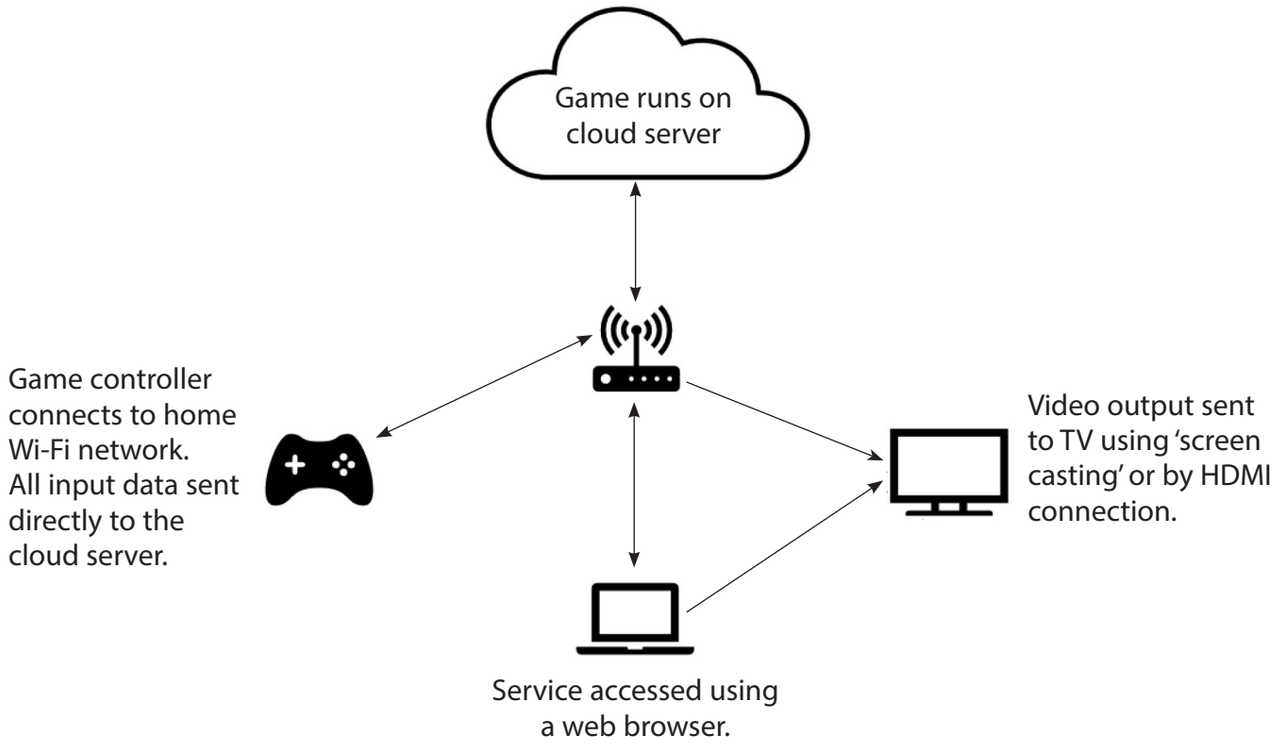


Figure 1

(a) The app for the gaming platform uses the UNICODE character set.

Give **three** reasons why the platform uses UNICODE rather than ASCII.

(3)

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(b) **Figure 2** shows some properties of an image that will be used as the platform's logo.

File type:	JPEG (.jpg)
Resolution	180 PPI

Figure 2

Describe how the image's properties impact the way that it is stored and represented by computer systems.

(3)

(c) Explain **two** benefits to gamers of using a cloud platform for gaming.

(4)

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2

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(d) The platform uses a reward system to encourage users to play more.

Figure 3 shows how the rewards are calculated using a flow chart.

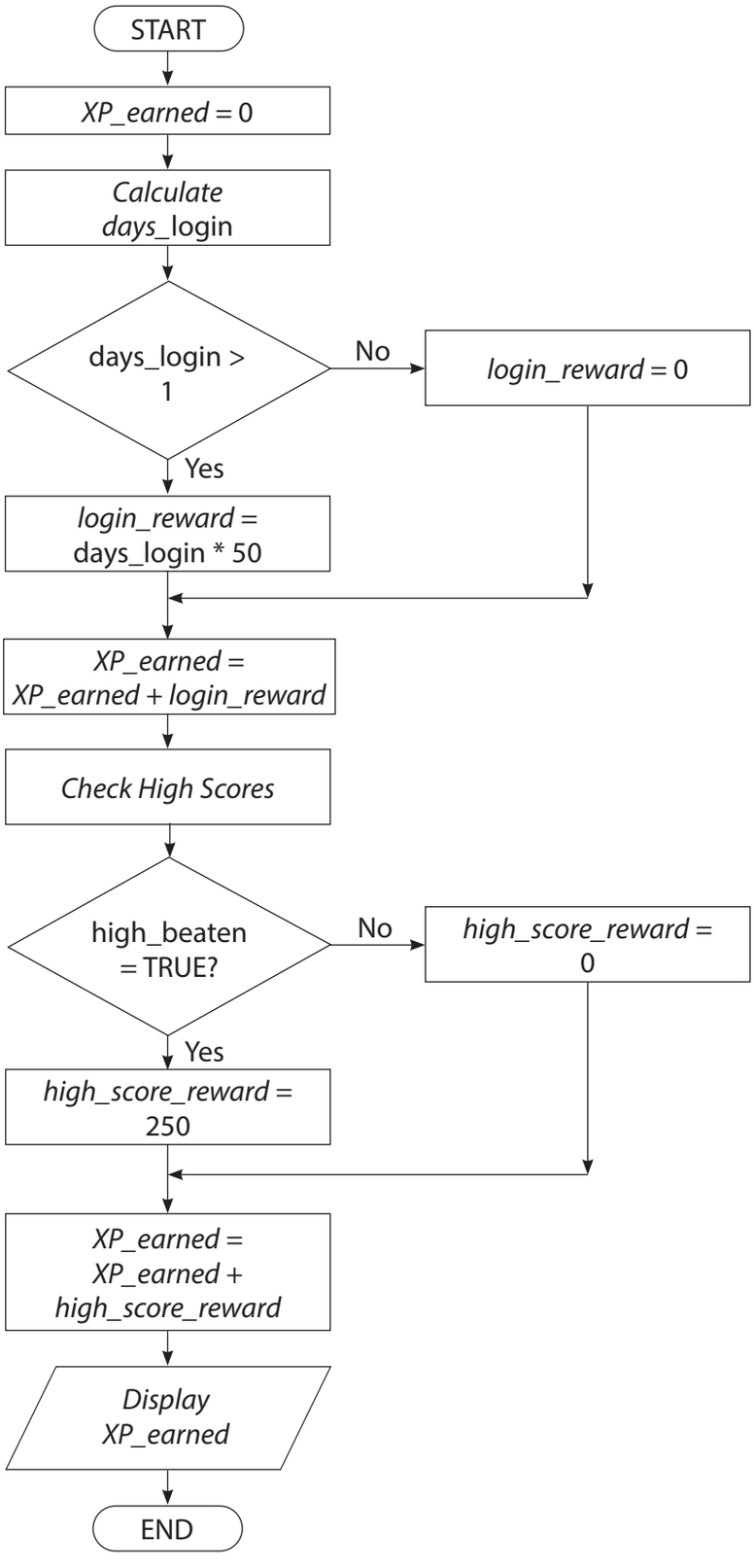


Figure 3

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Calculate the output value of *XP_earned* for each of the scenarios shown in the table.

(4)

Scenario Number	Scenario	Output
1	days_login = 1 high_beaten = TRUE	
2	days_login = 1 high_beaten = FALSE	
3	days_login = 3 high_beaten = TRUE	
4	days_login = 7 high_beaten = TRUE	

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(e) Analyse the benefits and drawbacks of different data connections that could be used with the cloud gaming platform.

Your analysis should cover connections that can be used to transmit data and connect devices.

(6)

(Total for Question 2 = 20 marks)

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QUESTION 3 BEGINS ON THE NEXT PAGE

3 Wakana is a network administrator for a company that designs and produces digital media content.

(a) Wakana copies some files to a remote server.

The system she uses to transfer the files uses automatic repeat request (ARQ) as an error correction system.

Describe how ARQ helps ensure reliable data transmission.

(4)

(b) The company Wakana works for wants staff to be able to work when away from the office. It will provide staff with remote access to files and data.

Discuss the potential security concerns of providing remote access and ways in which these could be mitigated.

You should support your discussion with examples that are relevant to the scenario.

(6)

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(c) The company is rapidly expanding. In six months, the company has grown from 20 members of staff to over 100 and is still growing.

Wakana currently uses optical media to back up data. Using optical media no longer meets the company's needs.

Discuss other data storage and recovery systems Wakana could implement.

You should support your discussion with examples that are relevant to the scenario.

(8)

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(Total for Question 3 = 18 marks)

4 Azra is an office manager for a GP surgery.

Her work requires her to:

- schedule and manage patient appointments
- organise work schedules for the office staff, cleaners and GPs
- organise salaries and payrolls
- communicate with patients, pharmacies and hospitals about medical issues.

(a) Discuss the ways that Azra could make use of software to support her work.

You should support your discussion with examples that are relevant to the scenario.

(10)

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(b) Azra wants to replace the computers and network hardware in the office.

Discuss the factors that Azra will need to consider when implementing new hardware.

Some of the factors you may want to consider are timescales, testing and migration to the new system, but you may want to consider other factors.

You should support your discussion with examples that are relevant to the scenario.

(12)

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(Total for Question 4 = 22 marks)

TOTAL FOR PAPER = 80 MARKS

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