

Please check the examination details below before entering your candidate information

Candidate surname

Other names

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

Centre Number

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Learner Registration Number

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Tuesday 22 January 2019

Morning (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 David owns a shop that provides professional printing services for products such as photographs, leaflets and signs.

Customers provide the company with a copy of the files that require printing.

David receives files from customers as uploads to the shop's website or on storage media (e.g. SD cards).

David also has a 'self-service' section in his shop for small jobs such as printing a small number of photographs from a mobile phone.

Figure 1 shows a basic plan of David's shop and some of the computing systems he uses.

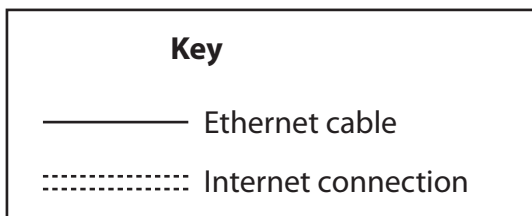
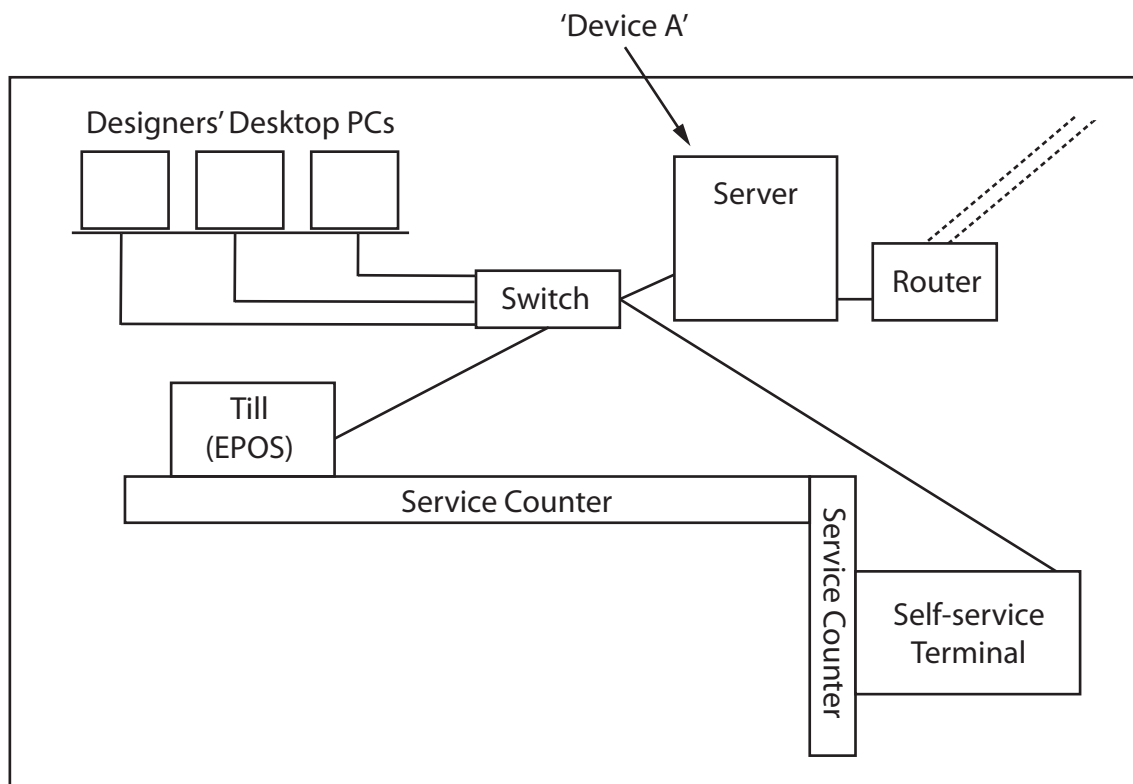


Diagram not to scale

Figure 1

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(a) David's computer systems use a server. This is shown as 'Device A' in **Figure 1**.

Describe **two** functions David's server could perform.

(4)

Function 1

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Function 2

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David offers a custom design service where his staff will design and create products to meet customer requirements.

The staff use desktop PCs when producing these products. The table shows some of the specifications of the PCs.

RAM	12 GB
CPU	Quad Core 3.2GHZ
Storage	1 TB SSD

(b) Explain why the designers would benefit from a large amount of RAM.

(2)

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(c) Explain why a large secondary storage capacity (1TB SSD) may not be needed for these desktop PCs.

(2)

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David is replacing the computers used by his designers. He needs to choose between desktop PCs and laptops.

(d) Explain **one** benefit to the **designers** of continuing to use desktop PCs.

(3)

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(e) Explain **one** way that choosing desktop PCs instead of laptops will help to save money.

(3)

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(f) Explain the way in which an Operating System (OS) will be used on each of the named devices.

Your explanation should include:

- the type of OS
- why that type of OS is suitable.

(6)

Device: Till

OS

Reason

Device: Server

OS

Reason

(Total for Question 1 = 20 marks)

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- 2 Jia is a teacher in a college. She uses a range of computer systems to support the teaching and assessment of students.

Jia tests her students regularly to monitor their progress. She represents the test data using matrices.

Figure 2 shows an example of a matrix that Jia uses.

It represents the scores in a single unit of study. It shows the scores of three students from two tests.

	Tests	
Students	45	32
	12	33
	36	25

Figure 2

- (a) Jia wants to use her matrices to store data for two other units of study. She will use this information to calculate the students' final score.
- Each unit has two tests.
 - Unit 2 forms a larger portion of the qualification than Unit 1.
 - The final score is calculated by:
 - multiplying the scores in Unit 2 by 2 to get the final Unit 2 score
 - adding the Unit 1 score to the final Unit 2 score.
 - Unit 1 scores: **Student A** 43, 12 **Student B** 50, 43 **Student C** 35, 25.
 - Unit 2 scores: **Student A** 23, 11 **Student B** 21, 21 **Student C** 13, 17.

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Calculate the students' final score using matrices.

You **must** show your working.

(4)

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Student A final score

Student B final score

Student C final score

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(b) **Figure 3** shows another matrix of marks awarded by Jia.

23	91	12	33
33	87	17	54
56	76	10	54

Figure 3

The matrix in Figure 3 will be stored in memory as an array.

Write the matrix as an array using column-major order.

(2)

(c) The table shows scores that students have received in two assignments.

Jia has calculated the difference between assignment 1 and assignment 2 to see if students have improved or not.

Complete the table to show how the **difference** would be represented as an 8 bit binary number.

You may use 'left most digit' OR 'two's compliment'.

(2)

	Assignment 1	Assignment 2	Difference	8 bit binary
Student X	56	58	2	
Student Y	67	43	-24	

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(d) Jia uses a relational database to store data about the students.

The data held includes:

- some personal information (name, DOB, etc.)
- the qualifications they are studying
- exam entries and test results
- records of class work/progress.

Explain **one** benefit of using a relational database for this task.

(4)

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(e) Jia uses a laptop computer. She stores some data on her laptop and some data on the college network.

Explain the impact that storing data across multiple computer systems will have on Jia.

You should cover the impact on access and productivity.

(6)

Access

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Productivity

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(Total for Question 2 = 18 marks)

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3 Grant is a multimedia designer who creates a range of digital content for clients all over the world.

(a) Grant uses Voice over Internet Protocol (VoIP) to communicate with his clients.

Describe how VoIP allows users to make voice calls over the internet.

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QUESTION 3(C) BEGINS ON THE NEXT PAGE



(c) Grant wants to use symmetric key encryption to protect the data in the files that he sends to his customers.

Discuss the benefits and drawbacks of using symmetric key encryption to protect Grant's files.

(10)

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(Total for Question 3 = 20 marks)



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(b) Sarwar has decided that the entertainment system will use a Central Processing Unit (CPU) designed for a desktop PC (microcomputer) rather than a mobile CPU.

Evaluate the implications of Sarwar's decision.

Your evaluation should consider the impact on the user and the system.

(12)

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TOTAL FOR PAPER = 80 MARKS



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