



Cambridge O Level

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COMPUTER SCIENCE

3175/12

Paper 1 Theory

May/June 2021

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **12** pages. Any blank pages are indicated.

1 The table contains **three** applications in which a sensor could be used.

Give a suitable sensor that can be used in each application.

A different sensor must be given for each application.

Application	Sensor
monitoring the flow of liquid in a pipe	
counting the number of vehicles using a road	
controlling an automatic watering system in a greenhouse	

[3]

2 **Three** data transmission methods and **three** descriptions are given.

Draw a line to connect each transmission method to a correct description.

Transmission method

Description

simplex

data can be sent and received at the same time

duplex

data can only be sent or received

half-duplex

data can be sent and received but **not** at the same time

[2]

3 The Internet relies on the use of IP addressing.

(a) State what the letters IP represent.

I P

[1]

(b) Describe the role of an IP address.

.....

[2]

4 Storage media can be magnetic, optical or solid state.

The table shows **five** storage media.

Tick (✓) to show whether each storage media is Magnetic, Optical or Solid State.

Storage media	Magnetic (✓)	Optical (✓)	Solid State (✓)
Removable Hard Disk Drive			
Digital Versatile Disc (DVD)			
Hard Disk Drive (HDD)			
USB Flash memory			
Blu-ray disc			

[5]

5 Describe the role of Random Access Memory (RAM) in a computer.

.....

.....

.....

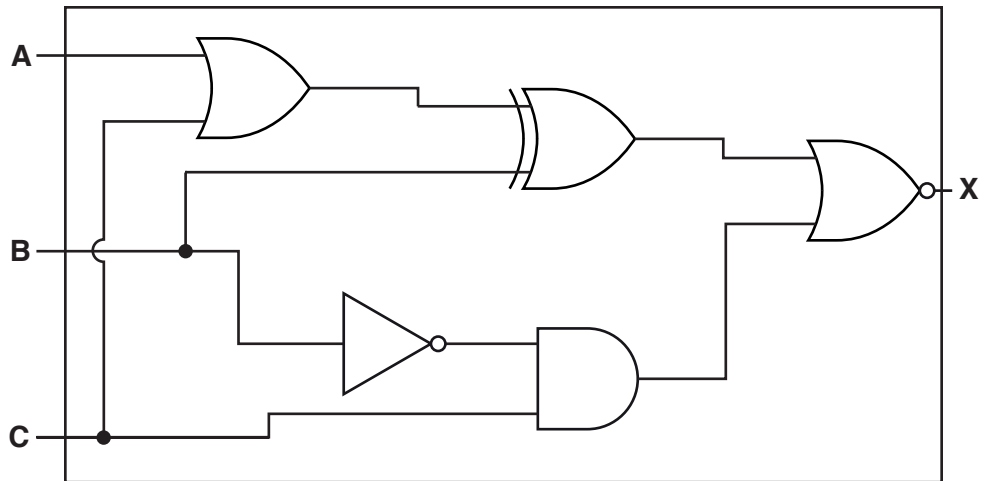
.....

.....

.....

..... [3]

6 (a) For this logic circuit:



Complete the truth table.

A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

9 Malik is setting up a local area network.

- (a) Three security issues that could affect the network are denial-of-service (DoS) attacks, viruses and hacking.

Explain what is meant by each of these security issues.

Denial-of-service attack

.....

.....

.....

Viruses

.....

.....

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Hacking

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.....

.....

[6]

- (b) To help protect personal data when it is transmitted over the network, Malik decides to use symmetric encryption.

Explain how symmetric encryption is used to protect the data.

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[4]

(c) Explain **two** benefits of Malik using serial data transmission to transmit data around the network.

Benefit 1

.....

.....

.....

Benefit 2

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.....

.....

[4]

10 A computer is used to record how many people have entered a concert. This value is stored using 10-bit binary.

The current binary value stored is: 0001110111

(a) Convert this binary value to denary.

..... [1]

(b) When the concert starts, 314 people have entered.

State the binary value that will be stored in the computer.

..... [2]

(c) Convert the denary number 314 to hexadecimal.

..... [3]

11 Some types of software can be described as shareware or free software.

Draw lines to link each description to a correct type of software.

A description can be linked to more than one type of software.

Description	Types of software
is subject to copyright legislation	shareware
code can be modified and redistributed	free software
a free trial version of the full software	

[2]

12 A system uses odd parity when transferring data.

(a) Indicate the correct parity bits for the data shown.

Parity bit	1	1	0	1	0	0	1
	1	1	1	1	1	1	1

[2]

(b) A parity check may **not** always be able to detect an error in transmission.

Give a situation in which this could occur.

.....

.....[1]

14 State **three** functions of a proxy server.

Function 1

.....

.....

Function 2

.....

.....

Function 3

.....

.....

[3]

15 Billie has purchased a 3D printer.

(a) State **one** use of a 3D printer.

.....[1]

(b) Describe how a 3D printer works.

.....

.....

.....

.....[2]

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