

Candidate Marks Report

Series : B 2025

This candidate's script has been assessed using On-Screen Marking. The marks are therefore not shown on the script itself, but are summarised in the table below.

Centre No :	PK470	Assessment Code :	9618
Candidate No :	65	Component Code :	12
Candidate Name :	MUHAMMAD UMAR ISLAM,		

In the table below 'Total Mark' records the mark scored by this candidate.

'Max Mark' records the Maximum Mark available for the question.

Paper:	9618/12	
Paper	50 / 75	
Total:		
Question	Total /	Max
	Mark	Mark
1	2	/ 2
2a	3	/ 4
2b	1	/ 2
3ai	0	/ 1
3aii	2	/ 2
3b	3	/ 3
3c	1	/ 4
4a	1	/ 2
4b	0	/ 2
4c	2	/ 4
4d	0	/ 2
5a	1	/ 2
5b	2	/ 2
5c	1	/ 3
5d	3	/ 3
5e	1	/ 3
6a	1	/ 1
6b	1	/ 1
6ci	1	/ 1
6cii	1	/ 1
6d	2	/ 2
7a	1	/ 1
7b	NR	/ 1
7ci	1	/ 1
7cii	1	/ 1
8ai	2	/ 2
8aii	2	/ 2
8bi	3	/ 4
8bii	2	/ 2
9a	2	/ 2
9b	2	/ 2

10a	4	/ 4
10b	1	/ 2
10c	0	/ 1
11	0	/ 3



Cambridge International AS & A Level

CANDIDATE
NAME

MUHAMMAD UMAR ISLAM

CENTRE
NUMBER

P K 4 7 0

CANDIDATE
NUMBER.

0 0 6 5

COMPUTER SCIENCE

9618/12

Paper 1 Theory Fundamentals

October/November 2025

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- 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.
- You may use an HB pencil for any diagrams, graphs or rough working.
- Calculators must **not** be used in this paper.

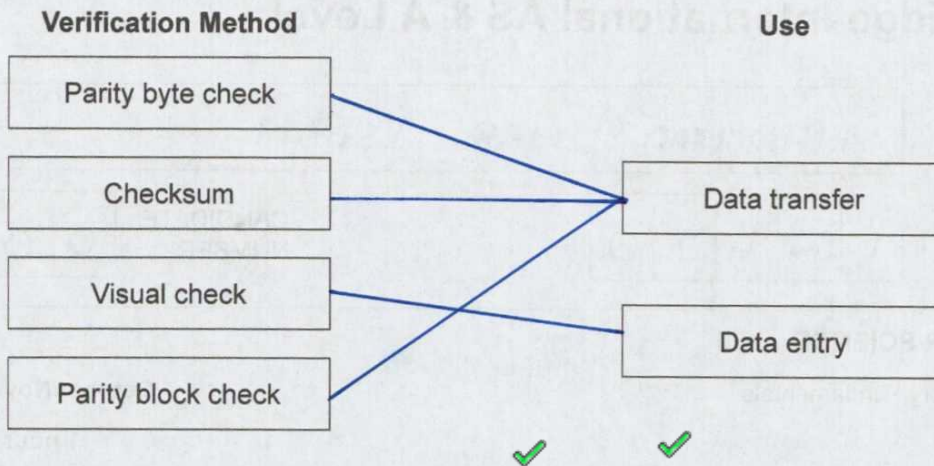
INFORMATION

- 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 16 pages.



- 1 Draw **one** line from each verification method to indicate whether it is used during data transfer or data entry.



[2]

- 2 (a) Complete the table by describing each term.

Term	Description
Copyright	a right of someone's over their property, that it may not be used by someone for their own benefit without the owner's consent.
Open Source (Initiative)	a type of software (licence) under which user can change the source code of the software, that might or may not be free of cost.
Shareware	a type of software that has a trial period, that user can use the software for that time and it can't be further distributed nor can any changes be made to it.
Software Licence	a licence type under which a software is released, and it has its terms and condition, the user must adhere to.

[4]





(b) Describe the purpose of a code of conduct.

To maintain an environment (professional), where limits are defined, there must be a way of interaction, that must be adhered to, ~~eliminate~~ and Every body must be respected and valued. [2]

3 (a) (i) State what is meant by relative addressing.

~~Operand~~ is used to ~~find~~ contents are + operand. [1]

NE

(ii) Registers such as the Accumulator (ACC) and the Index Register (IX) are used in the CPU.

Identify two special purpose registers used in the CPU. Do not include the ACC or IX in your answers.

1 CIR ✓
2 MAR ✓ [2]





- (b) The following table shows part of the instruction set for a processor. The processor has two registers: the ACC and an IX.

Instruction		Explanation
Opcode	Operand	
LDM	#n	Immediate addressing. Load the number n to ACC
LDD	<address>	Direct addressing. Load the contents of the location at the given address to ACC
LDI	<address>	Indirect addressing. The address to be used is at the given address. Load the contents of this second address to ACC
LDX	<address>	Indexed addressing. Form the address from <address> + the contents of the index register. Copy the contents of this calculated address to ACC
LDR	#n	Immediate addressing. Load the number n to IX
<address> can be an absolute or symbolic address # denotes a denary number, e.g. #127		

The current contents of the main memory and the index register are shown.

Address	Instruction
98	8 ✓
99	16
100	3
101	98
102	32 ✓
IX	2

Write the contents of the ACC after each instruction is executed.

Instruction	Value in ACC
LDM #98	98 ✓
LDI 101	8 ✓
LDX 100	32 ✓

[3]



- (c) A student buys a new computer. The table shows the specifications of the old computer and the new computer.

Old computer	New computer
1.8 GHz dual core processor	2.3 GHz dual core processor
16 MB cache	32 MB cache

Explain why increasing the clock speed and increasing the cache memory will improve the performance of the computer.

Clock speed ... increase ... in clock speed results in more instructions to be carried out, ^{now} in the ~~same~~ more Fetch-Execute cycles, processing improved, the performance of computer improved.

Cache memory ... since cache memory has more capacity, so can store more ^{data or} instructions, those instructions or data that is in frequent use, can be stored there. resulting in faster access time, hence performance improved. [4]

- 4 A relational database, SHIPPING, stores data about the ships in a company and the containers that are carried on the ships.

The database has the following tables:

CONTAINER(ContainerID, Type, Weight, OwnerName, ShipID)

SHIP(ShipID, Type, Capacity, ShipName)

- (a) Describe the relationship between the two tables. Refer to the primary and foreign keys in your answer.

The ShipID is primary key in SHIP and is foreign key in the CONTAINER. There is repetition of data, Type is present in both tables, ~~both~~ apart from that both tables are dependent on their primary keys. [2]

- (b) The table CONTAINER needs an additional field to store the data for the last inspection date.

Write a Structured Query Language (SQL) script to add one field to the table CONTAINER to store the date of last inspection of the container, for example 08/07/2019.

ADD CONTAINER {
LastInspectionDate DATE};
[2]

- (c) Write an SQL script to return the number of containers stored in the database for the ship with the name Caledonia.

SELECT SUM(ContainerID)
FROM CONTAINER, SHIP
WHERE CONTAINER.ShipID = SHIP.ShipID AND SHIP.ShipName = 'Caledonia';
[4]



(d) Describe the purpose of a developer interface in a Database Management System (DBMS).

The
~~An~~ interface ~~that~~ hides the complexities and
allows to make changes, ~~and~~ additions or
improvements easily.



[2]

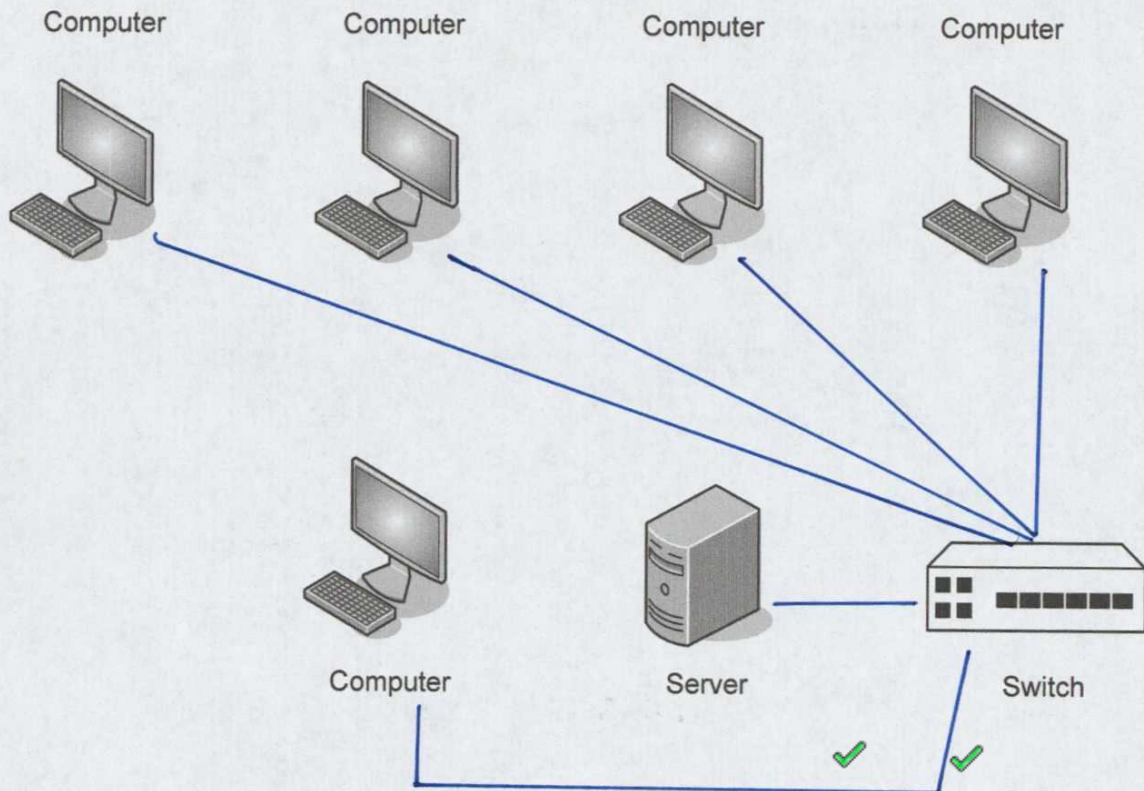


5 A local area network (LAN) has five computers, one switch and one server.

(a) Describe the characteristics of a LAN.

Covers a small geographical area, e.g. a building. Uses a hub or switch. ~~or~~ may a router is used to connect LAN to the internet. [2]

(b) Complete the following diagram to show how these devices are connected in a star topology.



[2]

(c) Describe how packets are transmitted between two hosts using a star topology.

The sender device sends data to the router. The data has recipients address, router uses it to find destination address from the routing table. The data is directly sent to the recipient device. [3]



(d) Another type of network is a bus network.

Ethernet is used to transmit and receive data between the devices on the bus network.

Describe how collisions are detected and managed on this network.

Ethernet uses CSMA/CD, the devices monitor the communication channel and only send data when it is idle. ~~It~~ When several devices transmit ^{data} at the same time, collision happens. Transmission is aborted and each device waits a random amount of time before retransmitting. If collision happens again, random time is increased. [3]

(e) Complete the table by identifying one threat to computer and data security posed by networks and the internet.

Describe the threat and give a method of prevention.

Threat	Description	Prevention
Hacking ✓	the user's computer is accessed without the consent with intention to steal or corrupt data. Hacker may misuse personal data, or delete it or may sell the information, leading to identity theft or possible scams	Encryption and Back-up

[3]



- 6 (a) A sound file is compressed by reducing the sampling rate.

State whether this is lossless or lossy compression. Justify your choice.

Type of compression lossy

Justification the sampling rate is reduced, now the
sound file has lesser ^{no. of} samples, others are discarded,
data is lost. ✓

[1]

- (b) The following table shows some words and corresponding denary values.

Word	Denary value
Computing	55
Science	56 —
Computers	57
are	58
Brilliant!	59
is	60 —
Fun!	61
Amazing!	62 —

The following table shows three bytes of data that have been received.

Use the table to find the corresponding words from the binary values received.

Binary value	00111000	00111100	00111110
Word	Science	is	Amazing! ✓

Working 00111000 00111100 00111110

..... $8+16+32$ $4+8+16+32$ $2+4+8+16+32$

..... $\Rightarrow 56$ $\Rightarrow 60$ $\Rightarrow 62$

[1]



- (c) A computer system uses even parity. The least significant (rightmost) bit of each byte is the parity bit.

(i) Complete the byte by writing the missing parity bit:

							parity bit ↓
0	1	0	1	1	1	0	○



[1]

- (ii) The computer also uses parity block check. The parity block check uses even parity. Computer A transmits four bytes of data to computer B, followed by a parity byte. Computer B receives the following sequence of bytes.

								parity bit ↓
1	1	0	1	1	0	1	1	1
0	1	1	1	0	0	0	0	*
0	0	0	1	1	0	1	1	
0	1	1	1	0	1	0	0	
parity byte →	1	0	1	0	0	0	0	*



Following transmission, one of the four bytes of data has an error in one of the bits.

Circle the bit that has been altered during the data transfer.

[1]

- (d) A bitmap image has a resolution of 1000 pixels wide by 2000 pixels high. The colour depth is 16 bits.

Calculate an estimate of the file size in megabytes. MB

Show your working.

$$\frac{1000 \times 2000 \times 16}{8 \times 1000 \times 1000} \Rightarrow 4$$

File size 4 megabytes

[2]



- 7 (a) The following binary addition is performed using 8-bit registers.

Complete the calculation using binary addition.

$$\begin{array}{r} 10000111 \\ + 00111001 \\ \hline 11000000 \end{array}$$

1100 0000

Answer

[1]

- (b) A computer uses the Unicode character set.

128 256

State the number of bits used to store one character from the Unicode character set.

SEEN

[1]

- (c) ASCII is another character set. The ASCII value for the character 'h' has the denary value 104.

- (i) Write the Binary Coded Decimal (BCD) value for the ASCII character 'h'.

0001 0000 0100 [1]

- (ii) Write the hexadecimal value for the ASCII character 'h'.

68 [1]

$$\begin{array}{r} 64 \\ 32 \\ \hline 96 \\ 8 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 64 \\ 32 \\ 8 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 01101000 \\ \hline \end{array}$$

8 A restaurant accesses software and stores data using cloud computing.

(a) (i) Give two benefits of storing data using cloud computing.

- 1 data is stored remotely, restaurant does not have to have huge storage to store their data.
- 2 can access data from anywhere, provided that there is internet access.

[2]

(ii) Give two drawbacks of using cloud computing.

- 1 unable to access data when there is no internet access.
- 2 if the security is compromised at location, where data is stored, data could be stolen, lost or maybe corrupted.

[2]

(b) The restaurant uses touchscreens as input devices to allow staff to select items from a menu.

(i) Explain how a touchscreen converts the point of touch to a selection from the menu.

if Resistive touchscreens are used, then when staff clicks the screen to choose something the two layers, (upper layer and lower glass layer) they make contact, which completes the circuit and that point is processed to find ^{coordinates of} point of contact. In case of capacitive screens, when the ^{person} staff touches the screen, the circuit is closed, the charge travels and point of contact is processed to find the coordinates and they are used to determine the choice. [4]

(ii) The image files that are displayed on the touchscreen have been corrupted.

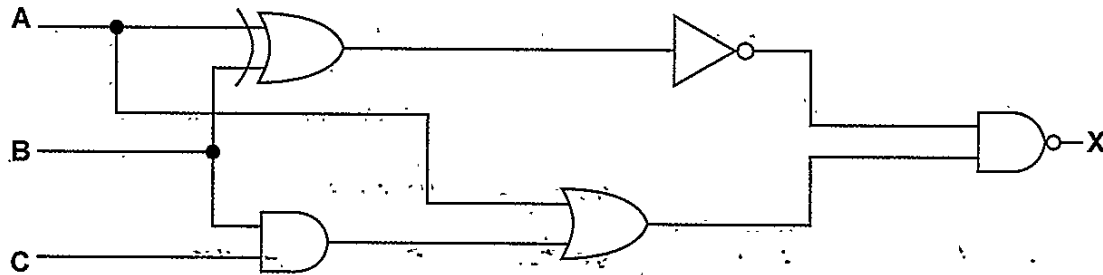
Identify two examples of utility software that could be used to recover the images.

- 1 Back up software
- 2 Disk repair software

[2]



- 9 (a) Consider the following logic circuit:



$\text{NOT}(A \text{ XOR } B) \text{ NAND}(A \text{ OR}(B \text{ AND } C))$
Write the logic expression for the logic circuit. Do **not** simplify the expression.

$X = \text{NOT}(A \text{ XOR } B) \text{ NAND}(A \text{ OR}(B \text{ AND } C))$ [2]

- (b) Consider the following logic expression:

$$X = \text{NOT}((A \text{ NAND } B) \text{ XOR } (\text{NOT } A \text{ OR } \text{NOT } C))$$

A truth table for the logic expression is given:

Row number	A	B	C	X
1	0	0	0	1
2	0	0	1	0
3	0	1	0	1
4	0	1	1	0
5	1	0	0	1
6	1	0	1	0
7	1	1	0	1
8	1	1	1	1

There are **three** errors in the truth table.

Identify the **three** errors in the truth table by writing the row numbers with an incorrect output.

Error 1 Row number 2

Error 2 Row number 4

Error 3 Row number 7

[2]

10. A programmer is developing a computer program:

- (a) Explain how the programmer can first use an interpreter and then a compiler to develop the computer program.

Interpreter can be used while writing ^{the} program, to see real-time ^{being} changes made. It can be used to run a section of program to test it. ~~and~~

Compiler can be used once the program is completed, ~~make an~~ compile the program and make an executable file. That file can be used multiple times without requiring recompiling each time program runs helps saves a lot of time. [4]

- (b) The programmer releases the program as Free Software.

Describe what is meant by Free Software.

A software ~~The user can~~ that users can make changes to, as desired, in the code, and can further distribute the program under the same terms ^{as} when it was received. [2]

- (c) A user downloads the computer program from the internet.

State what should be included as part of the download to make sure the program is authentic.

Product key [1]





- 11 An automated system opens doors when a person is detected within 2 metres. The system closes the doors when there is no longer a person within 2 metres.

Identify whether the automated system is an example of a monitoring system or a control system.

Justify your choice.

Monitoring or Control Control System

Justification Since, the system detects and takes
in information (data) and then a resulting
is performed (opens the door) according to the
data. This implies that it is a control
system rather than NE monitoring, as otherwise
it would only record information (data) NE [3]

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