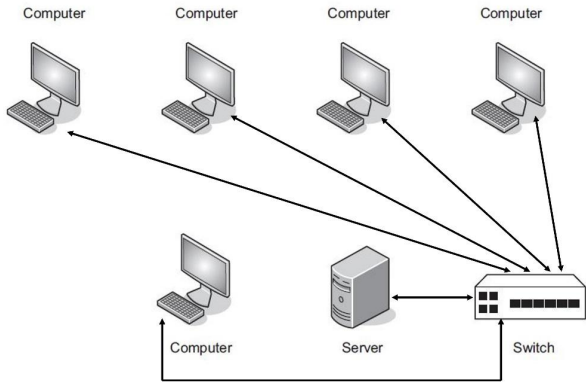


8(a)	1 mark for each correct explanation, max 2 marks Virus: Malicious program/software that replicates/copies itself and deletes/alters files/data stored on a computer Pharming: Malicious code/software installed on a computer which redirects user to a fake website to obtain personal data
8(b)	1 mark per bullet point, max 3 marks e. g. - Students should consider privacy issues - Students should not make inappropriate use of social networking // Students should not engage in cyberbullying - Students should not copy work that is not their own - Students should abide by the school rules/guidelines for accessing the network - Students should only use the school network for legitimate purposes - Students should not hack / crack other computers
8(c)	1 mark per bullet point, max 4 marks e. g. Negative Impacts - If students use AI to shortcut learning, they may miss out on developing reasoning and problem-solving skills // Students may not be learning anything // It could lead to a decline in specific skills - It could have negative impacts on student communication // heavy reliance on AI may limit opportunities for collaboration, teamwork, and face-to-face communication - Emphasises the digital divide// some students may not have access to the technology - The AI answer might not be correct leading to mis-information - Increased screen time and isolation could contribute to anxiety or loneliness Positive Impacts - Students given additional support may do better - Pupils who struggle in traditional settings may gain self-esteem through AI-assisted learning at their own pace Long-Term Impacts - Protection of intellectual property // ethical issues and considerations - Schools may need to redesign curricula and/or assessment to integrate AI

1	1 mark for 2 or 3 correctly connected verification method boxes, 2 marks for all 4 correct Verification Method Use <pre> graph LR subgraph Verification_Method [Verification Method] PBC[Parity byte check] C[Checksum] VC[Visual check] PBlC[Parity block check] end subgraph Use [Use] DT[Data transfer] DE[Data entry] end PBC --- DT C --- DT VC --- DE PBlC --- DE </pre>
---	---

5(a)	1 mark per bullet point, max 2 marks - Covers a small geographical area - Normally privately owned / dedicated infrastructure - Can use wired or wireless communication
5(b)	1 mark per bullet point, max 2 marks - All computers directly connected to switch and no other connections - Switch connected directly to server 
5(c)	1 mark per bullet point, max 3 marks - The sending device sends the packets to the switch - The switch checks the destination address on each packet ... and sends them only to the intended receiver
5(d)	1 mark per bullet point, max 3 marks - The use of <u>CSMA/CD</u> // Carrier Sense Multiple Access with Collision Detection - The workstations listen to the communication channel ... and send data only when there is no data being transmitted / the line is idle - If a collision is detected, transmission is aborted ...and a jamming signal is sent - The workstation calculates a random wait time before trying to re-transmit - The random time is increased if there are multiple collisions

5(e)

1 mark for correct threat

1 mark corresponding description

1 mark for correct method of prevention

Threat	Description	Prevention
Malware / Virus	Malicious code that can alter/delete files	Anti-virus // Anti-malware // Firewall
Spyware	Records keystrokes which are sent to third party	Anti-spyware // Firewall // Anti-malware
Hacking	Gaining <u>unauthorised</u> access to a computer network / device	Authentication // Firewall
Phishing	<u>Emails</u> supposedly from reputable companies are sent to trick people into revealing personal information	Use a spam filter // Do not open emails from unknown sources
Pharming	Users are directed to a bogus <u>website</u> that looks legitimate to obtain personal information	Use a VPN // Anti-malware// Do not open links or download attachments

6(a)	One mark per point: - Create a list of numbers that should generate all of the possible check digit values - and check that each / the / a generated value is as expected
------	---

6(b)

Note 2 different solutions with different mark scheme

Example solution – conversion to string and using a loop

```

FUNCTION CheckNumber(Number : INTEGER) RETURNS BOOLEAN
  DECLARE Total, Index, CheckDigit : INTEGER
  DECLARE NumString : STRING

  Total ← 0

  NumString ← NUM_TO_STR(Number)
  CheckDigit ← STR_TO_NUM(RIGHT(NumString, 1))
  // CheckDigit ← Number MOD 10

  FOR Index ← 1 TO LENGTH(NumString) - 1
    // 1 TO LENGTH(NUM_TO_STR(Number DIV 10))
    Total ← Total + STR_TO_NUM(MID(NumString, Index,
1))
  ENDFOR

  IF Total MOD 10 <> CheckDigit THEN
    RETURN FALSE
  ENDIF

  RETURN TRUE
ENDFUNCTION

```

Mark as follows:

- 1 Function Header including Identifier, parameters and return type
- 2 Use of Num_TO_STR to convert parameter
// Use of Num_TO_STR to convert parameter excluding least significant digit to a string
- 3 Extract CheckDigit from NumString
// Extract least significant digit from parameter
- 4 Loop for length of NumString - 1 following correct conversion to string
- 5 attempt to form sum of digits **in a loop**
- 6 completely correct sum of digits **in a loop and** of sum initialised **before loop**
- 7 Calculate check digit from sum
- 8 Compare sum with final digit of parameter **and** return appropriate Boolean value

Max 7

6(b)

Example solution – numeric version

```

FUNCTION CheckNumber(Number : INTEGER) RETURNS BOOLEAN
  DECLARE Sum, CheckDigit, Remainder: INTEGER

  Remainder ← Number MOD 10
  Number ← Number DIV 10

  CheckDigit ← Remainder

  Sum ← 0
  WHILE Number > 0
    Remainder ← Number MOD 10
    Number ← Number DIV 10
    Total ← Total + Remainder
  ENDWHILE

  IF Total MOD 10 <> CheckDigit THEN
    RETURN FALSE
  ENDIF

  RETURN TRUE
ENDFUNCTION

1 Function Header including Identifier, parameters and return type
2 Initialise Sum
3 Set CheckDigit to least significant digit in Number
4 Loop while Number > 0
5 attempt to use MOD and DIV to sum successive digits in Number in loop
6 completely correct sum of all digits in Number apart from least significant digit in loop
7 Calculate check digit from sum
8 Compare with CheckDigit and return appropriate Boolean value

```

Max 7