2019 Prelim 4E Comp P1 Marking Scheme

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1</td><td>
<table>
<tr><th></th><th>Number</th><th>Currency</th><th>Text</th><th>Date</th></tr>
<tr><td>COUNTA</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>RAND</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>SMALL</td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>LEN</td><td>√</td><td></td><td></td><td></td></tr>
</table>
1 mark for each row
</td><td>4</td></tr>
</table>

| Question | Answer | Marks |
|---|---|---|
| 2(a) | Headings OR Header OR Field Name<br>Text<br><br>Not accepted: Title | 2 |
| 2(b) | ROUND() | 1 |
| 2(c)(i) | =VAR(E3:E18) | 1 |
| 2(c)(ii) | STDEV() | 1 |
| 2(d) | MODE.SNGL() | 1 |

| Question | Answer | Marks |
|---|---|---|
| 3 | PMT() calculates the **instalment** for a loan with compound interest.<br>PPMT() calculates the portion of the instalment that is used to **reduce the principal** of the loan.<br><br>Not accepted: monthly payment / principal payment | 2 |

| Question | Answer | Marks |
|---|---|---|
| 4 | **Sum of** place-values method, and<br>Division-by-2 method | 2 |

| Question | Answer | Marks |
|---|---|---|
| 5 | Hexadecimal/ Binary<br>**Each character** in the ASCII code is represented by a **2-digit** hexadecimal or **7-bit** binary | 2 |

| Question | Answer | Marks |
|---|---|---|
| 6(a) | Any 2 relevant points:<br>Hackers may **encrypt** critical data and **ask for ransom**.<br>OR<br>Leaked or altered confidential data may **compromise** the proper operation of the university, e.g. exam papers and exam results.<br>OR<br>Personal and private data may be **exposed**, resulting in identity theft.<br>E.g. NRIC numbers<br>OR<br>**Intellectual property** may be stolen or lost.<br><br>Not accepted: Data is stolen (too vague) | 2 |

| | | |
|---|---|---|
| 6(b) | Any 2 relevant points:<br>Allow only **authorized storage devices** to be connected to the computer network.<br>OR<br>Use an **email filter** to block suspicious email and email attachments.<br>OR<br>**Encrypt all important data** so that hackers will not be able to read the data.<br>OR<br>Use **encryption in data communication** with between computers on the network.<br>OR<br>**Isolate the Local Area Network** from the Wide Area Network to prevent access from external computers. | 2 |

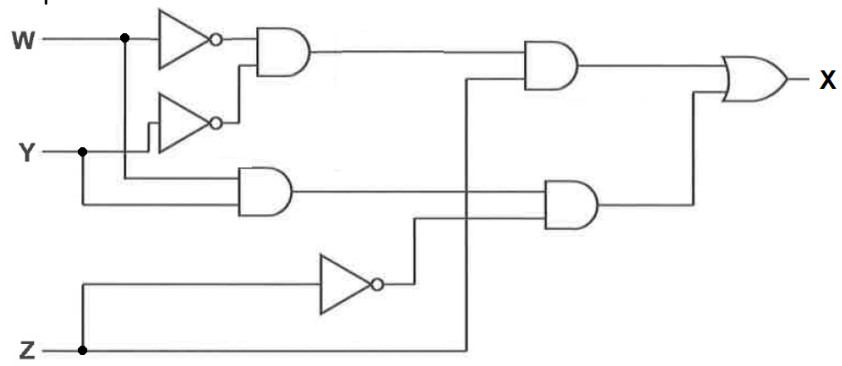
| Question | Answer | Marks |
|---|---|---|
| 7(a) | Phishing uses **emails** and **fake websites** that **appear to be from reputable companies** in order to steal personal information.<br><br>Pharming **intercepts requests** sent from a computer to a **legitimate website** and redirects to a fake website to steal personal data. | 2 |
| 7(b) | A virus **attaches itself to a harmless program** and modifies it so that when it is run, the virus **attaches copies of itself to other programs**.<br><br>A worm is a **computer program that runs automatically** and **sends copies of itself** to other computers.<br><br>1 mark if only mentioned about *whether it attaches itself to a program* | 2 |

| Question | Answer | Marks |
|---|---|---|
| 8(a) | Read the **privacy policy** of the organization. | 1 |
| 8(b)(i) | It may lead to **identity theft** if he does not use **encryption** when uploading the photo of the NRIC.<br>OR<br>It may lead to **identity theft** if he encounters a **phishing website**.<br>OR<br>It may lead to **identity theft** if his phone has a **cloud service** that backs up the NRIC photo to online servers **without proper access control**.<br><br>Note: *identity theft* must be mentioned. | 1 |
| 8(b)(ii) | Ensure that the website uses **public key encryption** (padlock icon) or its address starts with **"https:"**<br>OR<br>**Call the company first** to verify that the website address is legitimate.<br>OR<br>**Turn off cloud service** and **delete the photo immediately** after uploading. | 1 |

| Question | Answer | Marks |
|---|---|---|
| 9(a) | The central processing unit is the part of the computer that **processes data** and **follows instructions**. | 1 |
| 9(b) | The computer bus is **a collection of wires** for **transporting data** from one part of the computer to another. | 1 |

| Question | Answer | Marks |
|---|---|---|
| 10(a) | A memory where **stored data is lost** when **power supply** is interrupted. | 1 |
| 10(b) | Data stored on a RAM **can be easily changed** while data stored in a ROM cannot be easily changed. | 1 |

| Question | Answer | Marks |
|---|---|---|
| 11 | Z= (A' AND B) OR [(B AND C) AND (B' OR C)]<br><br>**1m** – A' AND B, B AND C<br>**1m** – B' OR C<br>**1m** – [… and …]<br>**1m** – Z = … OR … | 4 |

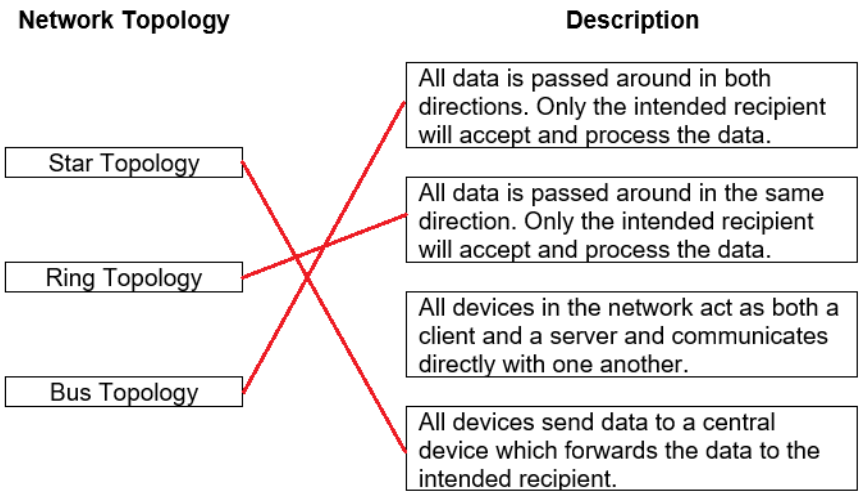
| Question | Answer | Marks |
|---|---|---|
| 12 | One mark for each for correct gates used at each level of immediate output.<br>  | 4 |

| Question | Answer | Marks |
|---|---|---|
| 13(a) | Device responsible for **modulation** and **demodulation**. | 1 |
| 13(b) | A **hardware interface/module** that enables the **transfer of data** between a **device/computer** and a **network**. | 1 |

| Question | Answer | Marks |
|---|---|---|
| 14(a) | Wired networks have **higher bandwidth** than wireless networks<br><br>Wired networks have **dedicated connection** while wireless networks are **prone to interference** from other devices that produce radio waves or microwaves<br>OR **susceptible to signal loss** over a certain distance.<br>OR bandwidth **decreases greatly** with more connected wireless devices | 2 |

| | | |
|---|---|---|
| 14(b) | Wireless networks have **better scalability** than wired networks<br><br>Adding more devices on a wired networks requires **additional cables and network devices** since **ports are limited**. Adding more devices on a wireless network just require some network settings. | 2 |

| Question | Answer | Marks |
|---|---|---|
| 15 | In client-server networks, data and resources are shared using **one or more dedicated servers**, while in P2P networks, these are shared **directly between computers**.<br><br>In client-server networks, each computer has a **distinct role**: client or server, while in P2P networks, each computer acts as **both** a client and server. | 2 |

| Question | Answer | Marks |
|---|---|---|
| 16 |  | 3 |

| Question | Answer | Marks |
|---|---|---|
| 17(a) | **0** **1** **1** **1** **1** **0** **1** **1** | 1 |
| 17(b) | The other method is using a **checksum**. | 1 |

| Question | Answer | | Marks |
|---|---|---|---|
| 18(a) | **Input(s)** | **Output(s)** | 3 |
| | Username: a string of characters **that matches a username in the database of the website**.<br><br>Password: a string of characters that **matches the password of the corresponding username in the database.** | Status: a string of characters that **informs the user whether login is successful or not**. | |
| | Accepted:- Button: whether login button is clicked or not | | |

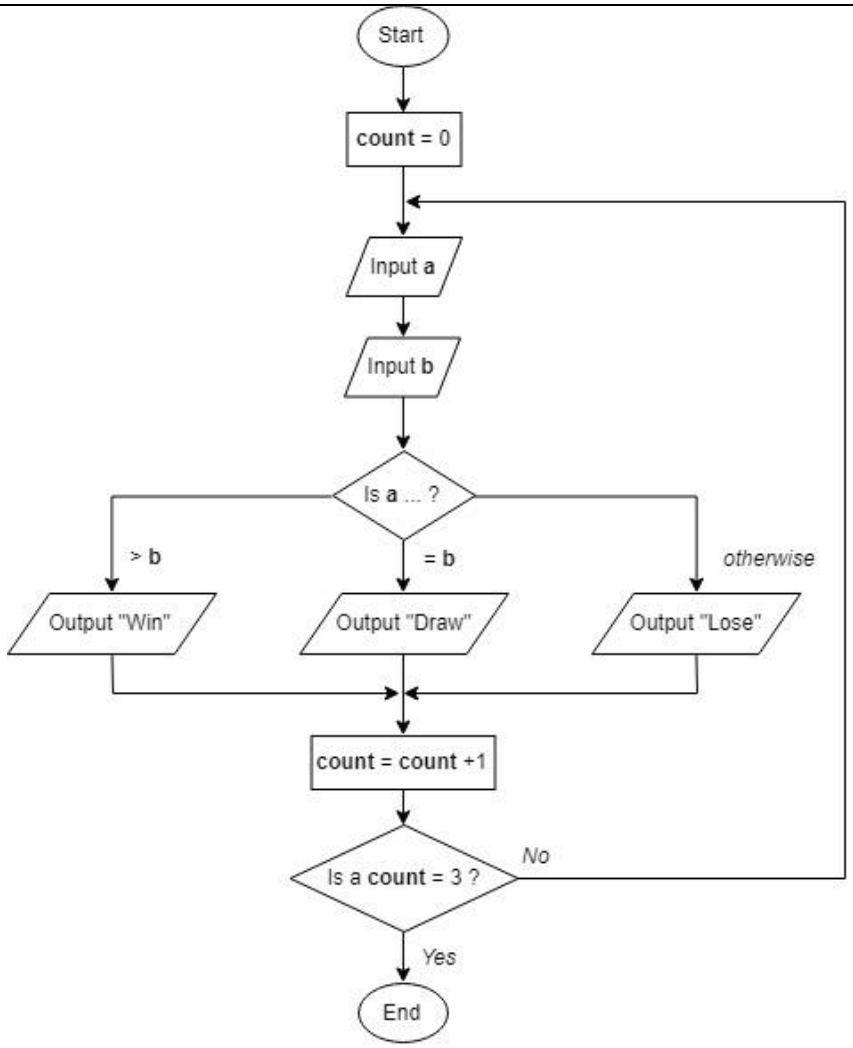
| | | |
|---|---|---|
| 18(b) | Firstly, the program **searches for the username** in the database.<br><br>If username is found, **check whether password input matches** the saved password of the username in the database<br><br>If username is found **and** password matches, **output** "Login is successful!" **Otherwise output** "Login failed!" | 3 |

| Question | Answer | Marks |
|---|---|---|
| 19(a) | It is the breaking down of a **complex problem** or process into smaller and **more manageable** parts.<br>Accepted: **difficult problem** into **easier/simpler sub-problems**<br><br>Not accepted: *program* instead of *problem* | 1 |
| 19(b) | Any two logical sub-problems:<br>• Find the largest common factor between two integers<br>  ○ Find all factors of an integer<br>  ○ Compare and identify the largest common factor between two integers<br>• Divide an integer by a factor/divisor to find a quotient | 2 |

| Question | Answer | Marks |
|---|---|---|
| 20(a) | | 4 |

| count | a | b | OUTPUT |
|---|---|---|---|
| 0 | | | |
| | 7 | | |
| | | 2 | |
| | | | Win |
| 1 | | | |
| | 4 | | |
| | | 4 | |
| | | | Draw |
| 2 | | | |
| | 8 | | |
| | | 9 | |
| | | | Lose |
| 3 | | | |

One mark for each column.

| | | |
|---|---|---|
| 20(b) |  <br>1m – Correct blocks for Start/End, Input a,b<br>1m – Initialize count, increase count by 1<br>1m – Decision block for case-otherwise<br>(accept 2 decision blocks if sequence is correct: >b, =b)<br>1m – Three correct outputs with inverted commas<br>1m – Decision block for repeat-until<br><br>-1 mark if any arrows missing<br>-1 mark if wrong block shape<br>-1 mark if flowchart lines are missing, incomplete or wrongly connected | 5 |

| Question | Answer | Marks |
|---|---|---|
| 21 | | 2 |

| Order | Stages of Program Development |
|---|---|
| 1 | Gather requirements |
| 5 | Implement code |
| 2 | Plan solutions |
| 4 | Test and refine code |
| 3 | Write code |

One mark deducted for a single mistake, e.g. 2↔4, otherwise no marks.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>22</td><td>
<table>
<tr><th>Programming Construct</th><th>Python Code</th></tr>
<tr><td>Sequence</td><td><pre>count=0
total=0</pre></td></tr>
<tr><td>Selection</td><td><pre>if x>0:
    count+=1
else:
    count-=1</pre></td></tr>
<tr><td>Iteration</td><td><pre>for x in range(3):
    print(x)</pre></td></tr>
</table>
(any 2 rows)<br>
1m awarded if both construct names are correct<br>
1m awarded if one construct name is correct with correct python code<br>
2m awarded if both construct names are correct and one correct python code
</td><td>3</td></tr>
</table>

| Question | Answer | Marks |
|---|---|---|
| 23(a) | A run-time error is an error that occurs **while a program is running**. | 1 |
| 23(b)(i) | Syntax errors may occur due to **spelling mistakes**<br>OR due to **incorrect sequence of symbols** in source code | 1 |
| 23(b)(ii) | Logic errors may occur due to **incorrect** or **incomplete algorithm**.<br>OR when the program **does not give the expected output.** | 1 |

| Question | Answer | Marks |
|---|---|---|
| 24(a) | A translator translates **source code** into **machine code**. | 1 |
| 24(b) | **Interpreters** and **Compilers**. | 1 |