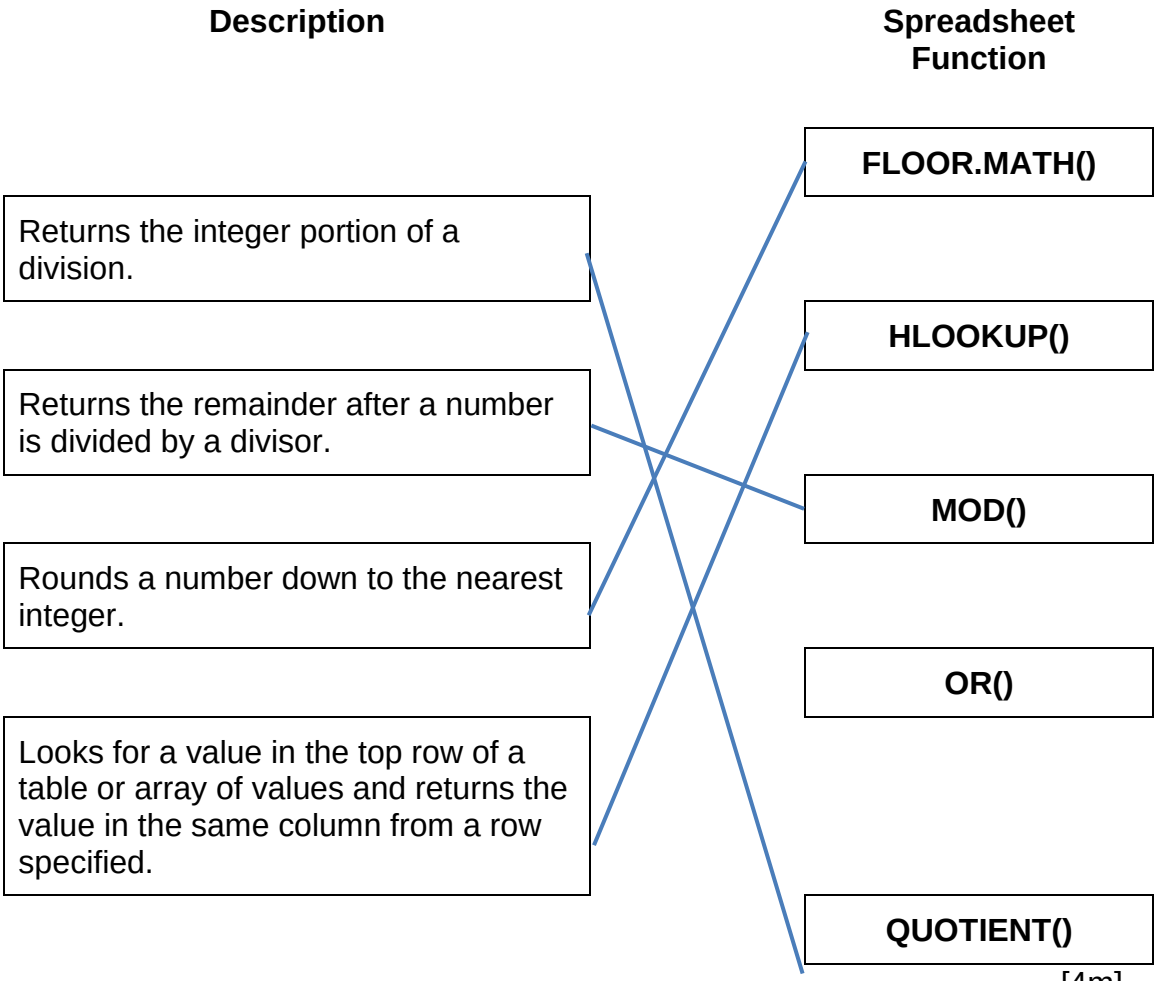
Marking Scheme

Q1

1 mark for each correct line. Maximum 4 lines.



[4m]

Q2

2(a) 35 employee names of string data types

and 35 employee reporting times of date data type [1m]

Note: Accept if the student specifies some valid range or dd-mm-yyyy or time.

2(b) Names of employees who are late for more than 3 times in the month

and their average number of minutes late, rounded to appropriate accuracy. [1m]

2(c) List [1m]

Any one of the following. Maximum 1 mark.

- A list of items <u>can be indexed</u>. In this case, the list can be used to store the 35 records.
- A <u>repetition / loop can be used to process</u> the list of 35 records and this makes the program code more concise.

Q3

3(a)(i)

Any 1 from the following. Maximum 1 mark.

- Shared resources: A network allows a group of computers to make use of shared resources such as printers or files.

- Shared Internet access: Depending on the network's configuration, every user who logs on to the network may have access to the Internet.

- Shared software: Software can be stored on the central server of a network and deployed to other computers over a network.

- Shared storage: Data files can be stored on a central server for ease of access and backup purposes.

- Communication: Computers in the same network are often able to share instant messages and emails for communication.

3(a)(ii)

Any 1 from the following. Maximum 1 mark.

- Initial costs: Installing a network could be costly due to the high setup and equipment costs.

- Maintenance costs: There are also subsequent costs associated with administering and maintaining the network.

- Security risks: As files are shared through a network, there is the risk of virus or worm attacks spreading throughout the network even with just one infected computer.

- Risk of data loss: Data may become lost due to hardware failures or errors. Using a network means regular data backups are needed.

- Server outage: If the server fails, the network will not be able to function, thus affecting work processes.

3(b) 1 mark for identified network device and 1 mark for the description.

Maximum 2 marks

Network Device	Description
Network interface controller (NIC)	NIC provides the hardware interface to enable the transfer of data between a device and a network.
Network hub	A device that transmits the received packets to all connected devices on the same network.
Network switch	A device that constructs a single network by connecting multiple similar networks together and it uses MAC addresses to keep track of the devices connected.
Router	A device that forwards packets between connected devices on separate networks by using the internet protocols where devices are identified by their IP addresses.
Modem	A device that is responsible for modulation and demodulation where modulation is to convert digital data into a form suitable for transmission while demodulation is the reverse process.
Wireless Access Point	Network hardware that provides a connection between wireless devices up to 100 metres away and can connect to wired networks.
Network bridge	A device that constructs a single network by connecting two similar networks together.

Q4

4(a)

Description of privacy and security threats	Term
The interception of requests sent from a computer to a legitimate website and redirection to a fake website to steal personal data or credit card details.	Pharming [1m]
[1m] A small file used by websites to store personal information on a user's web browser.	Cookie
The mass distribution of unwanted messages or advertising to email addresses.	Spamming [1m]

4(b) Description:

Type of authentication that uses evidence from both something the user knows and something the user owns. [1m]

Example:

To access his or her bank account online, the user has to confirm his or her identity by providing a secret password / personal identification number (PIN), followed by a one-time password (OTP) generated from the security token / a mobile phone that the user owns. [1m]

Q5

5(a) 1 mark for each correct Type of Storage Media.

Description	Type of Storage Media
Data is stored as very small pits or indentations that can be read or written by a laser.	Optical
Data is stored in electronic circuits called “flash memory” that have no moving parts.	Solid-state
Data is stored on a material that can be read or written by a head.	Magnetic

5(b)

372 x 1000
= 372000 bytes [1m]

5(b)

5600 / 1000
= 5.6 GB [1m]

Q6

6(a) (i) Media Access Control [1m]

(ii) Manufacturer identity number or Manufacturer Code [1m]

(iii) Device serial number or Product serial number [1m]

(iv) Any one of the following. Maximum 1 mark.

- To enable all devices to be uniquely identified.
- To identify a particular network interface controller.

6(b) #0000FF [1m]

6(c) The website is encrypted as its address starts with https:// . [1m]

Q7 1 mark for correct answer and 1 mark for showing relevant working.

7(a) 1010 (binary) = 10 (denary) = A (hexadecimal)

0011 (binary) = 3 (denary) = 3 (hexadecimal) [1m]

10100011 (binary) = A3 (hexadecimal) [1m]

7(b) C (hexadecimal) = 12 (denary) = 1100 (binary)

5 (hexadecimal) = 5 (denary) = 0101 (binary) [1m]

C5 (hexadecimal) = 11000101 (binary) [1m]

7(c) 217 / 16 is 13 remainder 9

13 / 16 is 0 remainder 13 (which is D is hexadecimal) [1m]

217 = D9 (hexadecimal) [1m]

7(d)

The position of a digit in a binary number determines its place value, which is represented by 2^N. The place value starts from 2^0 for the rightmost digit, with the power (N) increasing by 1 for each subsequent digit on the left. [1m]

Hence,

11100001 (binary)

$= 2^7 + 2^6 + 2^5 + 2^0$

(or = 128 + 64 + 32 + 1)

= 225 (denary) [1m]

Q8

8(a)

```
WHILE mark < 0 or mark > 25                                    [1m]
        OUTPUT "Invalid input! Enter marks between 0 and 25 inclusive: "
        INPUT mark                                             [1m]
ENDWHILE
```

[The 1m is awarded for both Error message and INPUT statement in the loop.]

8(b)

Test case condition	Test data for marks
Normal	Example: 1, 15
Error	Example: -2, 27
Boundary	Example: -1, 0, 25, 26

[3m]

Q9

9(a) Maximum 5 marks.

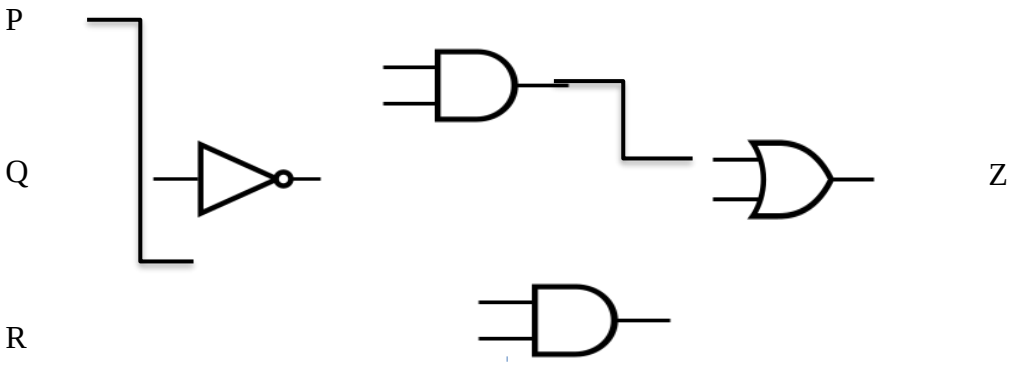
i	count1	count2	num	OUTPUT
	0	0		
0		1	12.4	
1	1		8	
2	2		25	
3		2	17.8	
4	3		6	3 2

[1m] [1m] [1m] [1m] [1m]

9(b) The algorithm is to <u>count the number of integers and floating point numbers</u> from an <u>input of 5 numbers</u>. [1m]

Q10

10(a) Maximum 4 marks.



Correct use of NOT gate	[1m]
Correct use of NAND gate	[1m]
Correct use of AND gate	[1m]
Correct use of OR gate	[1m]

10(b) 1 mark for each correct 2 rows. Maximum 4 marks.

Z = (P AND NOT Q) OR (P NAND R)

P	Q	R	Working Space			Z= B OR C
			A= NOT Q	B= P AND A	C = P NAND R	
0	0	0	1	0	1	1
0	0	1	1	0	1	1
0	1	0	0	0	1	1
0	1	1	0	0	1	1
1	0	0	1	1	1	1
1	0	1	1	1	0	1
1	1	0	0	0	1	1
1	1	1	0	0	0	0

Q11

11(a) Any one: removed, new_name, name, i [1m]

Note: The variable stated must be same case as given in the question.

11(b) One mark for each error identified. One mark for suggested correction.

Error 1 :	04 FOR i = 0 to len(name)	[1m]
Correction :	FOR i = 0 to len(name)-1	[1m]
Error 2 :	05 IF name[i]== " " and name[i].isdigit()== True	[1m]
Correction :	IF name[i]== " " or name[i].isdigit()== True	[1m]
Error 3 :	06 removed = i + 1	[1m]
Correction :	removed = removed + 1	[1m]
Error 4 :	08 new_name = name[i]	[1m]
Correction :	new_name = new_name + name[i]	[1m]

Q12

```
total_meal_price = 0
daily_financial_gap = 0


FOR stall = 0 to 5
     INPUT meal_price
     total_meal_price = total_meal_price + meal_price
NEXT
average_meal_price = total_meal_price / 6


FOR student = 0 to 119
     INPUT name_list[student], pocket_money_list[student]
NEXT


OUTPUT "The following students need financial help:"
FOR student = 0 to 119
     IF pocket_money_list[student] < average_meal_price THEN
          OUTPUT name_list[student], pocket_money_list[student]
          daily_financial_gap = daily_financial_gap
                        + average_meal_price - pocket_money_list[student]
     ENDIF
NEXT


monthy_financial_gap = 20 * daily_financial_gap
OUTPUT "The monthly fund needed is ", monthly_financial_gap
```

Note: Accept the following.

name_list = [ ]
pocket_money_list = [ ]

Note: Accept NEXT stall

Note: Accept NEXT student

Note: Accept the following.

INPUT n, p
name_list = name_list + [n]
pocket_money_list = pocket_money_list + [p]

Note: Accept NEXT student

Cont'd Q12

Correct initialisation of variables [1m]

Correct use of first FOR loop (or WHILE loop) with INPUT of 6 meal prices inside loop and calculation of average_meal_price after the first FOR loop [1m]

Correct use of second FOR loop (or WHILE loop) for INPUT of 120 students [1m]

Reading and storing of names and pocket money into the 2 lists is inside the FOR loop [1m]

Correct use of third FOR loop (or WHILE loop) for the 120 students

and Correct use of IF statement and display of student names and pocket money [1m]

less than average meal price inside the FOR loop

Correct calculation of daily financial gap, monthly financial gap [1m]

OUTPUT of monthly financial gap [1m]

Q13

13(a) Any 1 from the following. Maximum 1 mark.

- The Internet has enabled diverse cultures to interact and share ideas with each other.
- Social networking sites have also allowed users to remain connected with friends, family and colleagues even over long distances.
- AI has also made it possible for anyone to automatically transcribe and translate speech into different languages with remarkable speed and accuracy.

13(b) Any 1 from the following. Maximum 1 mark.

- Some people use the Internet to reinforce their existing opinions or to spread rumours and misinformation.
- This is worsened by the use of AI by some news and social networking sites to promote content that the reader is likely to be interested in, since most sites promote content based on how much they are able to elicit responses and not by their level of accuracy.

13(c) Any 1 from the following. Maximum 1 mark.

- The rise of smart phones has led to an increased focus on mobile devices and mobile applications in the computing industry.
- The rise of social media has led to the increased use of social media for marketing purposes.
- The rise of social media has helped businesses to better understand buying habits and consumer needs by analysing social media posts.
- Improvements in communications technology have also reduced business costs through the use of cheap and effective video conferencing calls in place of face-to-face meetings.

13(d) Any 1 from the following. Maximum 1 mark.

- Should some kinds of false information on the Internet be blocked or would this be taking censorship too far? There should be a balance between censorship and freedom of speech regarding false information on the internet.
- Is it right to collect and analyse social media posts in ways that the original authors may not have intended? There are privacy issues with respect to collecting and analysiing social media posts.

Q14

Correct Initialisation of variables before loop [1m]
Correct Loop Condition of count<30 and Increment of count variable [1m]
Correct INPUT region inside loop and OUTPUT count_region after loop [1m]
Correct If Condition of region=West and Increment of count_west variable [1m]
Correct use of shapes for all (including Terminator – 1 START and 1 STOP, Input/Output, Process, Condition) [1m]