

Sec 4 Prelims 2018

P1 Marking Scheme

1	Function	Description
	MAX	Returns the most frequently occurring or repeated value in the given numbers or the given range/cell references
	LARGE	Returns a user-defined number of characters starting from a position of the text value text
	MODE.SNGL	Returns the largest number out of the given numbers or the numbers in the given range/cell references
		Returns the kth largest number in a range of cells

2a 182 , correct working

2b 11110101, correct working

2c 22, correct working

3 Processor registers
ALU / control unit
control unit / ALU
RAM
ROM
Secondary storage

4a Data bus

Any two of the following:

- Carries / transports data / example of data ...
- ... that is currently being processed / that will be / has been processed
- Data can travel in both directions (bidirectional)

4b Address bus

Any two of the following:

- Carries / transports an address / location ...
- ... of the next item to be fetched
- Data travels one way (unidirectional)

- 5a** Language designed for humans to communicate instructions to computers
- 5b** *Compiler / #Interpreter
- 5c** Based on **5b**'s answer:
- *Compiler translates source code into machine code completely before running the compiled program
- #Interpreter translates source code into machine code while the interpreted program is running
- 5d** Based on **5b**'s answer:
- *Programs run at a faster speed because all the translation has been done beforehand / Compiler is not needed to run after compilation is complete / Syntax errors are detected before program is even run
- #Changes to the source code take effect immediately / Facilitates learning and experimentation as interpreters usually offer an interactive mode
- 6** Inputs: Names of 50 employees (string), Contract amount of 50 employees (float) [2 marks]
 Outputs: Name of the employee who secured the biggest contract and its contract amount. [2marks]
 Processes: Store the names with the corresponding contract amounts in an array/list. Search the list for the biggest contract amount and output the name of the employee and the contract amount. [2marks]
- 7** Error: `count`
 Correction: `count=0`
 Error: `PIN = PIN%10`
 Correction: `PIN = PIN//10` or `PIN = PIN/10`
 Error: `IF PIN == 5`
 Correction: `IF count == 5`
 Error: `UNTIL PIN >= 1`
 Correction: `UNTIL PIN < 1`
- 8a** Phishing
 It uses emails and fake websites that appear to be from reputable companies in order to steal personal information from users.
- 8b** Any two of the following:
- Email uses a generic greeting, "Dear Customer DBS", suggesting that it was sent automatically and not by a person
 - Email has grammatical, spelling and punctuation errors, "verifivation", "for your safety access has been locked", that suggest it is not from a legitimate source
 - Tone of email is excessively urgent or threatening, "Thank you for your immediate attention to this matter".
 - Email uses a generic sign off with no indication of the department and name of officer-in-charge of the case, "The team of DBS | Singapore"
 - URL is questionable as it has a pathname / filename that is a long unintelligible string of characters but most reputable sites tend to use more relevant pathnames / filenames.
 - The title of the email "Update Credit-card" did not match the content of

the email

- There are multiple and different hyperlinks provided for the same cause
- Banks would never initiate to ask for personal data through emails

9a Any two of the following:

- helps prevent unauthorised access / helps prevent hacking
- checks that data meets criteria / identifies when data does not meet criteria
- acts as a filter for (incoming and outgoing) data / blocks any unacceptable data / allows acceptable data through

9b Any three of the following:

- Encrypt the data so it cannot be understood by those not entitled to view it
- Password protected / biometrics / strong authentication / 2-factor authentication to help prevent unauthorised access
- Virus checking software that helps prevent data corruption or deletion / identifies / removes a virus in the system / scans a system for viruses
- Spyware checking software that helps prevent data being stolen/copied/logged / scans a system for spyware
- Drop-down input methods / selectable features to reduce risk of spyware / keylogging
- Physical method e.g. locked doors / CCTV timeout / auto log off to help prevent unauthorised access
- Network / company policies / training employees to educate users how to be vigilant
- Access rights allows users access to data that they have permission to view / prevents users from accessing data that they do not have permission to view

10 Protocol to use / (access) protocol
Domain name of web server / domain (name)
Name or path of page to request / filename

11

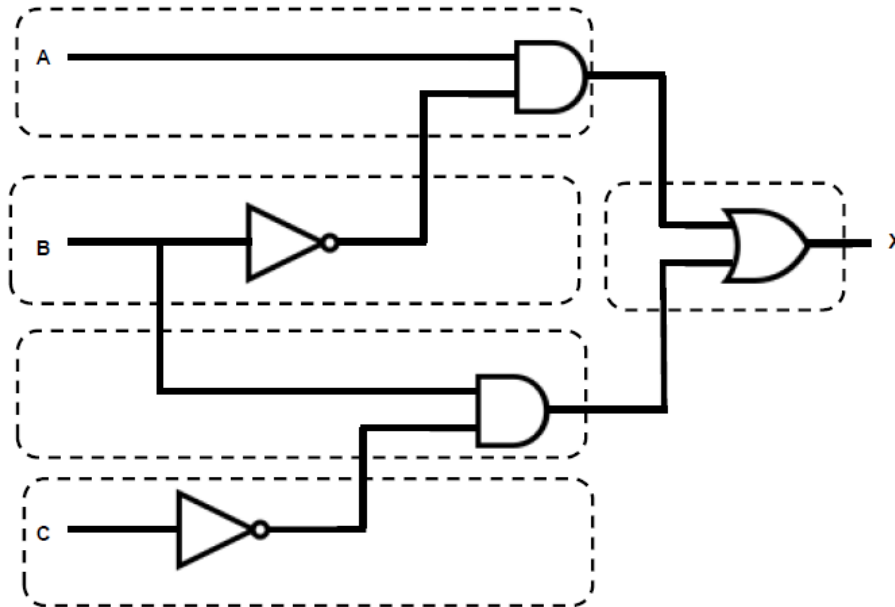
i	J	temp	num_list[j]	num_list[j+1]	OUTPUT
0	0				
	1				
		2	7	2	
	2				
		2	9	2	
	3				
1	0				
		4	7	4	
	1				
		4	9	4	
	2				
	3				
2	0				
		7	9	7	
	1				
	2				
	3				
3	0				
	1				
	2				
	3				
4	0				
					[9, 7, 4, 2]

12

0, 0,0,1. AND gate

13a $X = (A \text{ AND NOT } B) \text{ OR } (B \text{ AND NOT } C)$

13b



14a Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN)

14bi Any two of the following:

- High mobility as users can move about freely within the range of the wireless network
- Easier to add new devices to the network as router can be easily configured
- More organized without the mess of cables

14bii Any **one** of the following:

- Wired transmission is more reliable and unaffected by interference
- Wired transmission is more secure and less susceptible to interception and hacking
- Wired transmission is usually faster and higher bandwidth as cables provide dedicated connection
- Lower cost as equipment and cables are cheap

14c Any **two** of the following:

- In a client-server network, one or more higher capacity computers will act as servers while remaining computers are clients, but in a P2P network all computers are able to act as clients and servers.
- In a client-server network, each server contains data and other resources to be shared with clients, but in a P2P network users are able to share files and resources located on their computer and access that found on other computers in the network.
- In a client-server network, there can be high security as the server can control access rights centrally, but in a P2P network, security is low as individual computers are required to handle the security.
- In a client-server network, bandwidth is typically high but limited by the capability of the server, but in a P2P network, bandwidth varies

depending on size of request and whether the request can be divided into smaller requests to be handled by multiple computers simultaneously.

15 Suggested Solution (Pseudo-code)

```
word_list = []
counter = 0
num_smaller_than_4 = 0
num_bigger_than_4 = 0
WHILE counter < 20 DO
    INPUT word
    word_list[counter] = word
    IF length of word < 4 THEN
        num_smaller_than_4 = num_smaller_than_4 + 1
    ELSE
        IF length of word > 4 THEN
            num_bigger_than_4 = num_bigger_than_4 + 1
        ELSE
            OUTPUT counter
        ENDIF
    ENDIF
ENDWHILE
OUTPUT num_smaller_than_4
OUTPUT num_bigger_than_4
```

Any **eight** of the following:

- Initialization of 3 variables word_list (array), num_smaller_than_4, num_bigger_than_4
- Loop management 20 repetitions
- Input word (at each iteration of loop)
- Store word in word_list (array)
- Checking if word length is lesser than 4 ...
- Checking if word length is greater than 4 ...
- ... update num_smaller_than_4 / num_bigger_than_4
- Checking if word length equals 4
- ... outputs the list (array) index
- Outputs num_smaller_than_4, num_bigger_than_4