Section A - Topic 2

1 Complete the truth table for an NAND gate.

A	B	O
0	0	
0	1	
1	0	
1	1	

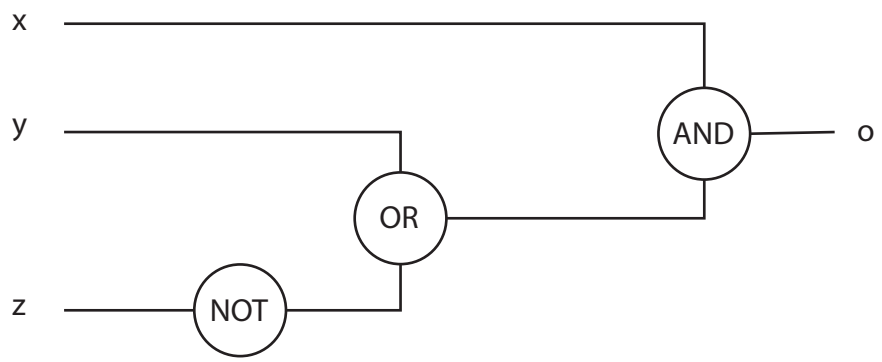
[2]

2 Complete the truth table for an NOR gate.

A	B	O
0	0	
0	1	
1	0	
1	1	

[2]

3 Look at this logic circuit:



Complete the truth table for this logic circuit:

x	y	z	working area	o
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

4 Here is a nibble of binary information.
Convert it to denary (decimal).

1 1 1 1

working area

[1]

5 Here is a byte of binary information.
Convert it to hexadecimal.

1 0 1 0 1 0 1 1

working area

[2]

6 Here is a decimal number.
Convert it to a byte of binary information.

7 9

working area

[4]

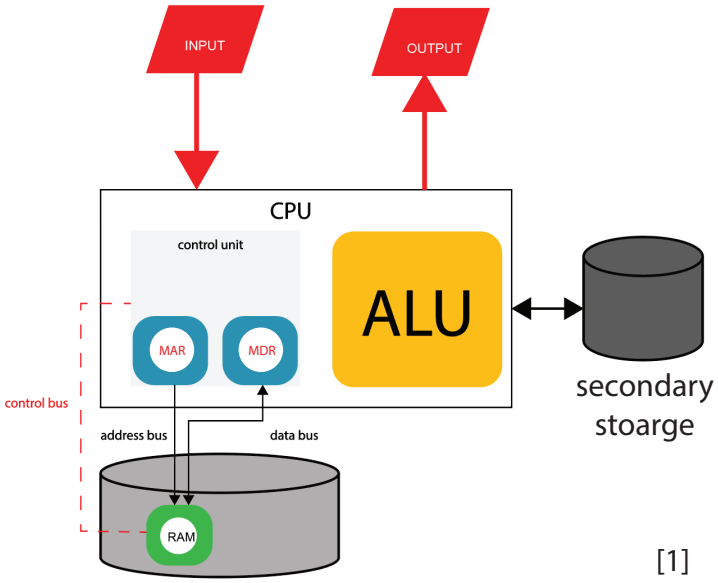
7 Here is a decimal number.
Convert it to a hexidecimal number.

2 5 5

working area

[4]

8 This disgram represents components used in the fetch-decode-execute cycle (machine instruction cycle).
Which part is responsible for decoding an instruction?



[1]

9 Which part is responsible for performing mathematical operations?

[1]

10 Identify 2 differences between RAM and Secondary Storage.

[2]

11 State 1 secondary storage device.

[1]

12 Describe the purpose of Virtual Memory.

[2]

13 List three features that you may expect to find in a GUI.

_____

_____

_____ [3]

14 List 3 functions of an operating system.

_____

_____

_____ [3]

End of Section A

Section B starts on the next page.

Section B - Topic 3 (Muliple Choice)

15 Which type of network best describes one that covers a large geographical area?

ⓐ WLAN

ⓑ WAN

ⓒ PAN

ⓓ VLAN [1]

16 A DNS server....

ⓐ retrieves the IP address of a given URL

ⓑ retrieves the URL of a given IP address

ⓒ increments an IP address until a desired status is reached

ⓓ decrements an IP address until a desired status is reached [1]

17 The Internet is fault tolerant. This means that

ⓐ it has many faults and consistently needs maintenance

ⓑ it never has any faults and is always in perfect working condition

ⓒ if a component breaks, it can continue working (mostly) as normal

ⓓ if a component breaks, the Internet will need to be reconfigured and will be unavailable for use [1]

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19 Data packets being routed on a mesh network such as the Internet

ⓐ always take the same route to the destination as each other packet in the message

ⓑ mostly likely take a different route than other packets and arrive in the correct order

ⓒ most likely take a different route than other packets and arrive in the wrong order

ⓓ never take the same route and always arrive in the correct order [1]

20 Which transmission medium offers the fastest transmission?

ⓐ radio waves
ⓑ electricity
ⓒ water
ⓓ light

[1]

21 The amount of data a communication channel can transfer in 1 second is know as its

ⓐ latency
ⓑ clock speed
ⓒ bandwidth
ⓓ resolution

[1]

22 119.43.0.7 is an example of

ⓐ a MAC address
ⓑ a URL
ⓒ a subchannel code
ⓓ an IP address

[1]

23 A communication channel operates at 80000bits/sec. How many bytes/sec is this?

ⓐ 800
ⓑ 8000
ⓒ 1000
ⓓ 10000

[1]

24 The name of the data transmission technology commonly used in a Local Area Network is

ⓐ Fibrenet
ⓑ Ethernet
ⓒ Othernet
ⓓ Alphanet

[1]

25 A function written in Java takes an array of STRINGS as a parameter. It sorts the array using a bubble sort algorithm and returns true when it has finished. Fill the blanks.

```
public static [          ] bubbleSort(String[] words){

   for(int i = 0; i< words.length; i++){

      for(int j = 0; j< words.length-1; i++){

           if([          ].compareTo(words[j+1])>0){

                [          ] temp = words[j];
                 words[j] = words[j+1];
                 words[j+1] = temp;
           }
      }
   }
   [                ]
}
```

[4]

26 A main program calls the function. If the returned value is true, it will display "Yay!". Otherwise it will display "Nay!". Complete the code.

```
[          ] result;

[          ] listOfWords = {"hat", "jackets", "elephants", "cold", "a"};

result = bubbleSort( [                ]);

if([          ]){
     System.out.println([      ]);
}else{
     System.out.println("Nay!");
}
```

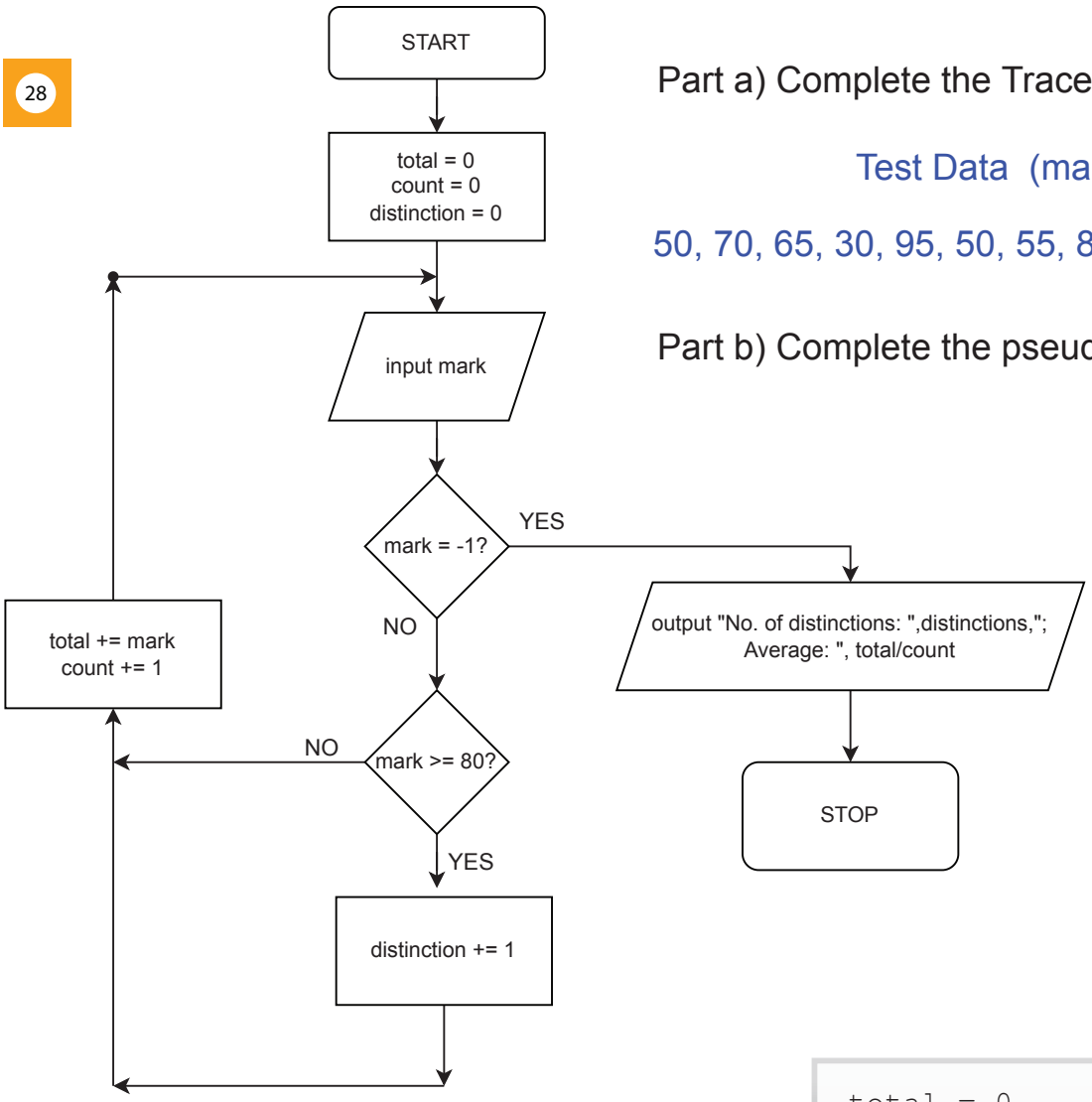
[5]

27 A mountaineer uses an app which uses satellite data to record elevations of the immediate area.
The elevation data (in meters) is stored in a 1-dimensional array of 100 numbers, `heights`.
When the mountaineer clicks the "Find Highest Elevation" button, the app outputs the elevation with highest number in the array.
Code an algorithm in pseudocode which will output the highest number in the array, `heights`.
Use pure code only - no imaginary built-in functions.

```
pre-condition: the lowest possible value stored in the array
is -400.
```

[5]

28



Part a) Complete the Trace Table [4]

Test Data (mark)

50, 70, 65, 30, 95, 50, 55, 85, 65, 35, –1, 45

total	count	distinction	mark	output

Part b) Complete the pseudocode [4]

```
total = 0
count = 0
distinction = 0

_________ mark

loop _______ mark != -1

   if _______________

        distinction += 1

   end if

   _____ = total + mark

   count += 1

   input mark

end loop

output "No of distinctions: ",
distinction, "; Average: ",
total/count
```