Answers

1 **(a)** RING Network - Any TWO from:

[textbook]

Advantages	Disadvantages
• Can operate over larger distances and handle more data	• If a computer or cable in the network fails, the entire network may fail as the data cannot be passed on
• Data packets that are sent between two computers will pass through intermediate computers, hence a central server is not required to manage the network	• Adding a new computer to the ring network would mean that the whole communication ring needs to be temporarily interrupted

-shared resources
-less efficient than star because it needs to travel through all other work stations first to get to destination work station
-a faulty connection between two stations can cause network failure
-it is difficult to add a new station/device as it has to come between 2 existing stations
-this type works well during heavy loading
-it is possible to create large networks using this topology

(b) STAR Network - Any TWO from:

[textbook]

Advantages	Disadvantages
• The load on each section of cabling is reduced as each computer uses a separate cable from the rest	• Uses more cabling than other topologies and hence costs more
• If a fault occurs at a computer or cable, it is easy to isolate the fault and do a replacement without affecting the rest of the network	• If the central network device fails, the entire network fails

-shared resources
-cable failure isolates/affects only the work station where cable failed
-if one station/connection fails the other devices are not affected
-if the central hub breaks down, the whole network fails
-it is easier to identify faults using this type of topology
-it is easy to expand this type of network

2 1 mark for each correct tick

Statement	True (/)	False (/)
Firewalls can monitor incoming and outgoing traffic.	✓	
Firewalls cannot block access to a certain website.		✓
Firewalls can be software and hardware.	✓	
Firewalls can act as intermediary servers.		✓
Firewalls can block unauthorised traffic.	✓	

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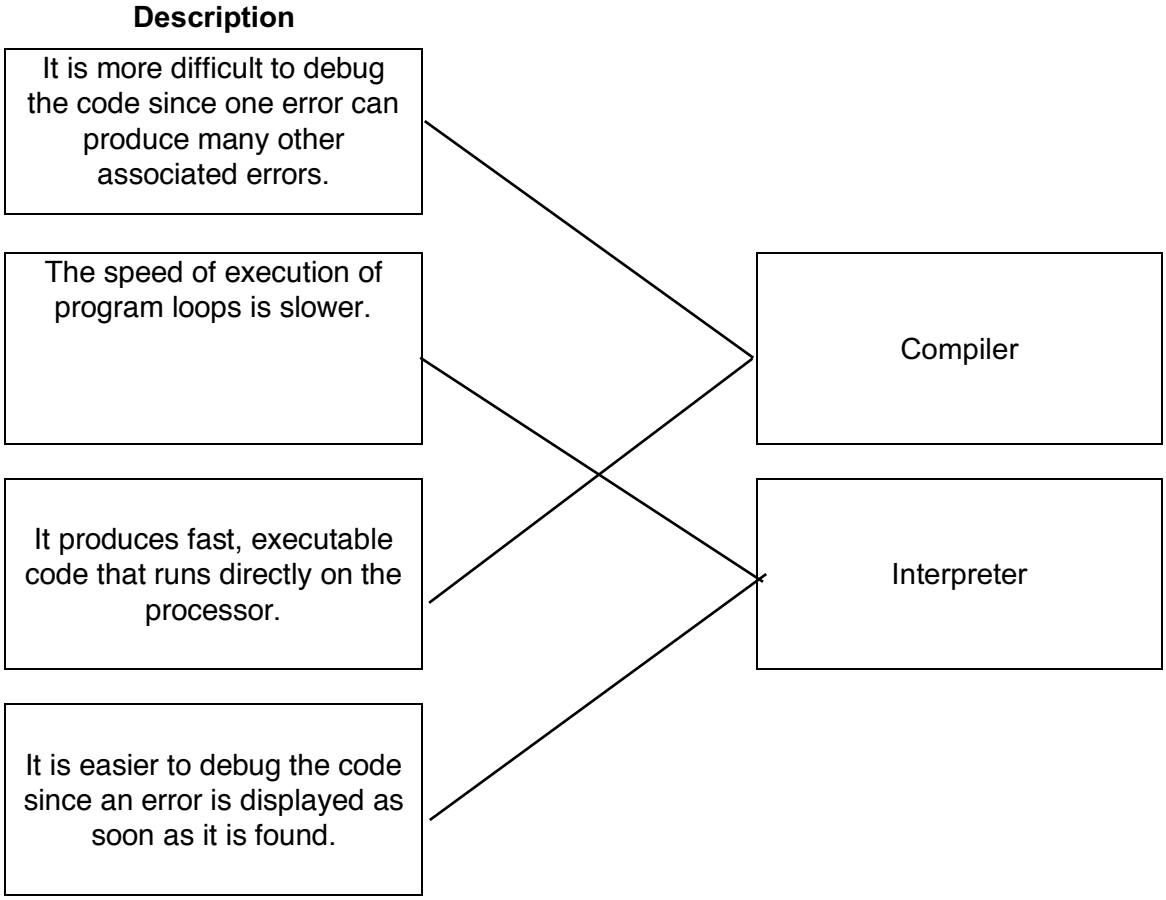

4 **(a) (i)** – value of count starts at 1 so only 999 iterations
– value of count reaches 1000, but before 1000th input

(ii) – line 1 should read count = 0
– line 5 should read count = 1001 (or count >1000)
– change to appropriate loop structure [2]

(b)

(i) – normal/valid (test data)
– any value in given range (1 to 12) e.g. 4

(ii) – abnormal/invalid (test data)
– any value which is outside the range/any value not acceptable
– i.e. letters, negative numbers, values > 12 e.g. adfrk, -20, 36

(iii) – extreme/boundary (test data)
– data which is on the boundaries/edges of the acceptable range
– i.e. 1 or 12 for extreme; 0, 1, 12 or 13 for boundary

– Month names, instead of values, are acceptable e.g. April

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Line 4 **correct line** `WHILE Number <= 99 OR Number > 1000`
Line 7 **correct line** `Num[Index] = Number`
Line 9 **correct line** `NEXT (Index)`
Line 10 **correct line** `PRINT Count`

6 **(a)**

□□(i) Plagiarism
□□(ii) Free and Open-Source software
□□(iii) Freeware
□□(iv) Shareware
□□(v) Ethics

(b) File name: ComputingPapers
Protocol: http(://)
Web server name: www.junyuansec.moe.edu.sg

(c) (i) First six digits: manufacturer code/manufacturer ID
(ii) Last six digits: serial number/serial ID of device/product

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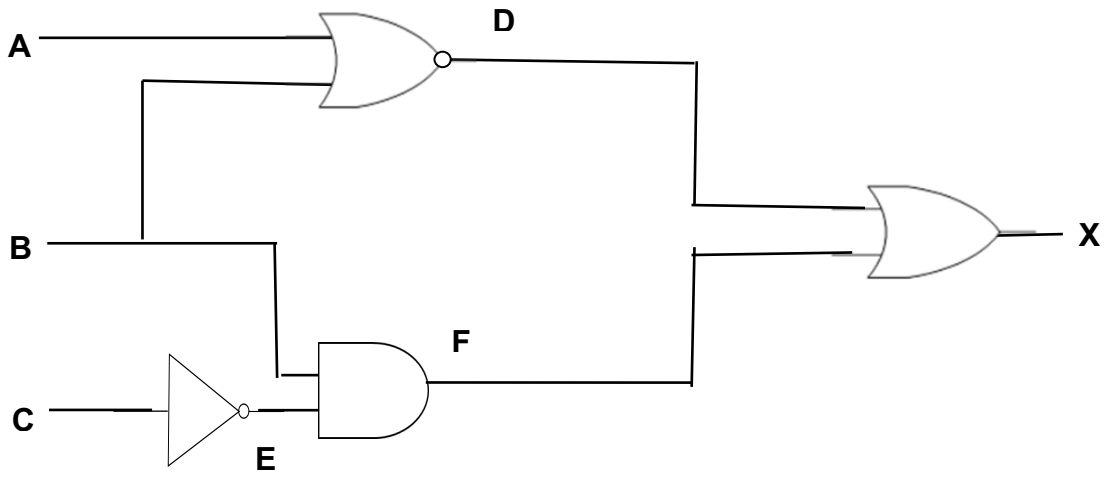
viruses: – malicious code which self replicates
– designed to delete, alter or corrupt files
phishing:
– sending emails to recipients claiming to be a legitimate company
– when email opened, recipient is directed to a bogus website/gets details about customer
pharming:
– malicious code installed on PC or a server
– code misdirects user to a fraudulent website (without their knowledge)
hacking:
– unauthorised access to a computer system
– in an effort to use data illegally (e.g. fraud)
– to change/delete/corrupt data on a computer
key logging/spyware
– program installed on a computer to monitor all key presses
– each key press is relayed back to the program writer
or spyware
– scan files on hard drive
– 'snoop' applications
shoulder surfing:
– the act of watching a person key in secure data (e.g. PIN, password, etc.)
– stealing security data by using binoculars, CCTV near ATMs etc. to watch key presses etc

8 **(a)**



(b)

Input			Working space			Output
A	**B**	**C**	**D**	**E**	**F**	**X**
0	0	0	1	1	0	1
0	0	1	1	0	0	1
0	1	0	0	1	1	1
0	1	1	0	0	0	0
1	0	0	0	1	0	0
1	0	1	0	0	0	0
1	1	0	0	1	1	1
1	1	1	0	0	0	0

(c) X = (NOT A NAND B) AND (B OR C)

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HighF	HighC	TempF	OUTPUT
–100	–100		
		68	
68	18	46	
68	18	50	
68	18	86	
86	27	65	
86	27	50	
86	27	40	
86	27	30	
86	27	–1	The highest temperature is, 86 Fahrenheit, 27 Celsius

10 **(a) (i)** (byte) 5

(ii) (column) 4

(iii) corrected byte is: **1 0 0 1 1 1 1 1**

(iv) that gives the value: **1 5 9**

(follow through applies)

(b) Two marks for each correct description

(i) Check digit

- A digit that is calculated from the data // uses modulo to calculate digit // valid description of modulo
- It is appended / added to the data
- Digit is recalculated when data is entered
- Digits are compared to check for error

(ii) Checksum

- A value is calculated from the data // Valid description of calculation
- It is transmitted with the data
- Value is recalculated after transmission
- Values are compared after transmission to check for error

11 **(a) (i)** 2 marks for 3 correct binary conversions, 1 mark for 2 correct binary conversions

0	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**1**	**1**	**1**

(ii) 1 mark for each correct hex value converted

1 A F

(b) **1** mark for working + 1 mark for correct answer

Working
– 1200 × 8 = 9600 (bytes)
– 9600/1024 or 9600/1000

Answer
– 9.4 or 9.6 kilobytes

(c) Any **one** from:

MAC (Media Access Control) address
– unique number that identifies a device (connected to the Internet)
– address is made up of manufacturer id + serial number of device
– address is allocated by the manufacturer

Any **one** from:

IP (Internet Protocol) address
– location/address of a device on the Internet
– address is unique for given Internet session
– address is supplied when a device connects to the Internet
– address is allocated by the network

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Sample program in pseudocode:

```
largest = 0
smarket1 = 0: smarket2 = 0
for item = 1 to 1000
        input price1, price2
        if price1 > price2 then smarket1 = smarket1 + 1
        if price2 > price1 then smarket2 = smarket2 + 1
        difference = price1 – price2
                if difference < 0 then difference = - difference
                if difference > largest then largest = difference
next item
output smarket1, smarket2, largest
```