Name: _____

Tutorial: _____

Question	Mark	Full Mark
1		25
2		18
3		13
4		12
5		4
6		8
Total		80

Answer **all** questions in space provided.

1.

a. Identify and explain **one (1)** activity for each operation (input, process, output and storage) based on the scenario given below.

Scenario:

You are on a busy street in Banting, Malaysia. You are feeling a bit thirsty and would love to get a cold drink. You spot a vending machine nearby and walk up to it.

Action:

1. You look at the selection of drinks available and choose a can of iced tea that costs RM2.50.
2. You locate the QR code on the vending machine.
3. You open your payment gateway (TouchnGo eWallet) on your phone and scan the QR code. Your available balance is RM50.30.
4. You confirm the payment.

Outcome:

The vending machine dispenses your can of iced tea. You take your drink and enjoy it as you continue on your way.

[8 marks]

Operation	Activity
Input	Read the selection of drinks entered by user (2 m) Read the QR code scanned by user (2 m) Read instruction to open TnG apps selected by user (2 m)
Process	Determine the cost of a can of iced tea which is RM2.50 (2 m) Determine the balance of money in TouchnGo eWallet which is RM50.30 (2 m) Calculate the new balance of TnG by deducting RM50.30 with RM2.50 (2 m) Verify the QR code by determine the information about that QR code (2 m)
Output	Dispense a can of iced tea (2 m) Display the balance after transaction of TouchnGo eWallet which is RM47.80 (2 m) Show the transaction was successfully or not via pop up message (2 m)
Storage	Store the transaction history in a database (2 m) Update / Store / Save the current balance in TnG e wallet which is RM47.80 (2 m)

b. Convert **ACE753$_{16}$** to binary number.

[5 marks]

A	C	E	7	5	3	
10	12	14	7	5	3	**1 m**
$2^3\ 2^2\ 2^1\ 2^0$	$2^3\ 2^2\ 2^1\ 2^0$	$2^3\ 2^2\ 2^1\ 2^0$	$2^3\ 2^2\ 2^1\ 2^0$	$2^3\ 2^2\ 2^1\ 2^0$	$2^3\ 2^2\ 2^1\ 2^0$	**1 m**
8 4 **2** 1	**8** **4** 2 1	**8** **4** **2** 1	8 **4** **2** **1**	8 **4** 2 **1**	8 4 **2** **1**	**1 m (underline / circle)**
1010	1100	1110	0111	0101	0011	**1 m**
1010 1100 1110 0111 0101 0011_2						**1 m**

c. Convert the hexadecimal number **8B0F** to a decimal equivalent.

[5 marks]

8	B	0	F	
8	11	0	15	**1 m**
8×16^3	11×16^2	0×16^1	15×16^0	**2 m**
32 768 +	2816 +	0 +	15	**1 m**
35599_{10}				**1 m**

d. Convert **8529** in decimal to octal number.

[4 marks]

	1 m	1 m
8	8529	
8	1066	1
8	133	2
8	16	5
8	2	0
8	0	2

Read from below to top **(Arrow ---- 1 m)**

20521_8 ----- 1 m

e. A CD can save up to 700MB. How many characters can be written in the CD if it supports the Unicode Coding Scheme.

[3 marks]

700 x 1024 x 1024 = 734 003 200 bytes — 1 m → change from MB to KB then to B
734 003 200 / 2 bytes — 1 m
= 367 001 600 characters — 1 m

OR
700 x 1024 x 1024 x 8 = 5 872 025 600 bits - 1m → change from MB to KB then to B then to bits
5 872 025 600 / 16 bits - 1m
= 367 001 600 characters - 1m

2. a.

i. Trace and write the Boolean expression for variable **Y** based on **FIGURE 1** below.

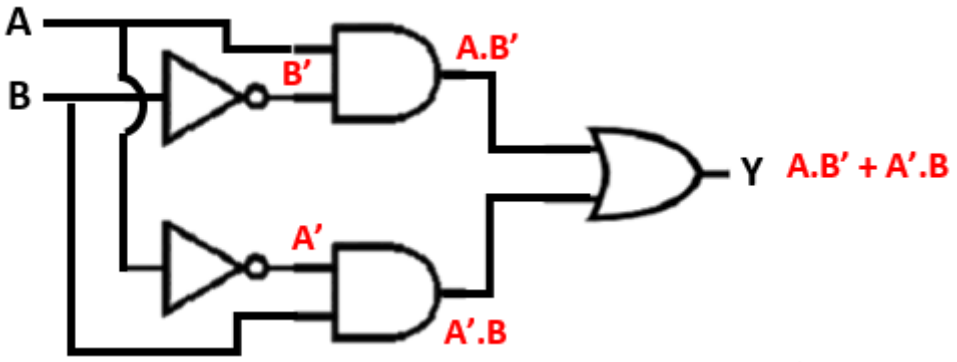


FIGURE 1

[4 marks]

Y = (A.B') + (A'.B) — **1 m (Tracing 0.5 m each & final gate Y 1 m)**

Ii. Based on your answer for **FIGURE 1**, if **A = 1**, **B = 0** state the final output. Show the steps clearly.

[3 marks]

Y = (A.B') + (A'B)
Y = ((1).(0)') + ((1)'.(0)) — 1 m
Y = (1.1) + (0.0)
Y = 1 + 0 — 1 m
Y = 1 — 1 m

or

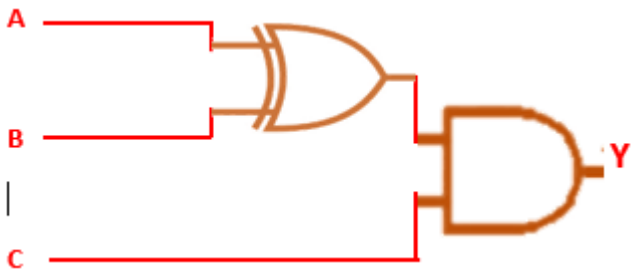
A	B	B'	A.B'	A'	A'.B	Y
1	0	1	1	0	0	1

b. Maria has won the grand prize (Y) in a contest. She needs to choose either she wants to go to Maldives (A) or Dubai (B), but not both and also RM5000 cash (C).
Draw the logic circuit to represent the scenario above.

[5 marks]

Y = (A ⊕ B) . C

Y = Maria won
A = Maldives
B = Dubai
C = RM 5000 cash



2m for each correct gate used
1m for correct label

c. Construct the truth table based on the Boolean expression given.

[6 marks]

$$\mathbf{P = (A \oplus C) + \overline{B}}$$

1 mark for each column

A	B	C	$A \oplus C$	B'	P
0	0	0	0	1	1
0	0	1	1	1	1
0	1	0	0	0	0
0	1	1	1	0	1
1	0	0	1	1	1
1	0	1	0	1	1
1	1	0	1	0	1
1	1	1	0	0	0

3.

a. Azani Clinik network consists of **one (1)** desktop at the registration counter and **two (2)** laptops on doctors' working tables, which access a network laser printer and centralized patient database from a powerful workstation.

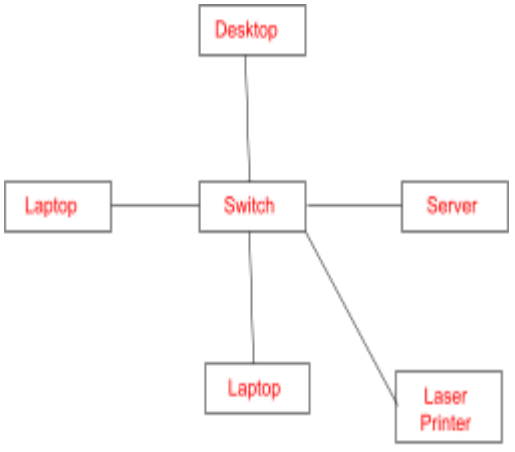
i. Identify the network architecture based on the above scenario.

[1 mark]

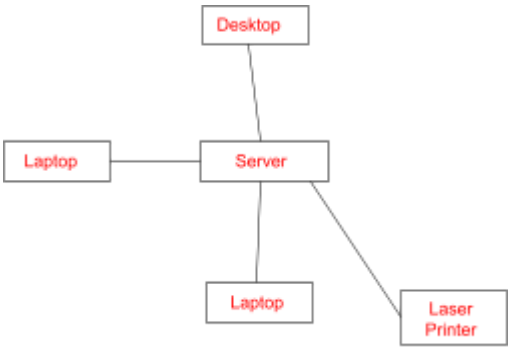
Client/ Server Network

ii. Sketch the network architecture based on your answer in **3**ai.

[5 marks]



0.5 for each correct node (not include switch) – 2.5m
0.5 for each correct connection – 2.5m
if 3(a)(i) wrongly identified– 0 marks for 3(a)(ii)



iii. State **one (1)** disadvantage of network architecture based on your answer in **3**ai.

[1 mark]

- Complex and costly to set up, need to purchase the file server, network operating system and requires an expert to maintain the network.
- Less reliable because too dependent on the server; failure of server will affect all the computers in the network

b. Mr. Ahmad Ali, General Manager of AI Nation corporate, recently discovered that the communication between his company's Accounts office and Human Resource office is extremely slow and signal drops quite frequently. These offices are 120 meters away from each other and connected via Ethernet cable.

i. What type of classification of network (**X**) is formed by having this kind of connectivity?

[2 marks]

Local Area Network (LAN)

ii. Explain **two (2)** differences between network classification in **3** b i (**X**) with another classification of network (**Y**).

[4 marks]

Network Classification X	**Network Classification Y**
A local area network (LAN) is a network that connects computers and devices in a limited geographical area such as a home, school computer laboratory, or small office complex.	A wide area network (WAN) is a network that connects computers and devices in a wide geographical area such as a multinational company or a national retail chain.
LANs are owned and operated by single person or organization	Multiple Ownership / Shared Ownership / Distributed ownership. Example : Distributed database applications (ATM banking system).

4.

a. Identify the network standard and the accessibility of information based on the given scenario.

[4 marks]

Scenario	Network Standard	Accessibility
Hamzah searches for a product online. He needs to identify the need, conducting research, refining the search and comparing products. By using various online tools and platforms, like search engines and e-commerce websites, Hamzah can find the best product that meets his needs and preferences.	Internet	Can be accessed by anyone around the world
Hamzah is one of XYZ company's customers. XYZ provides Hamzah with a secure and convenient way to access information, place orders, track order status, manage his account, and get support when needed.	Extranet	Can only be accessed by employees within (inside) the organization and suppliers, vendors, partners, and customers outside the organization

b. **FIGURE 2** shows the nodes connected to a network.

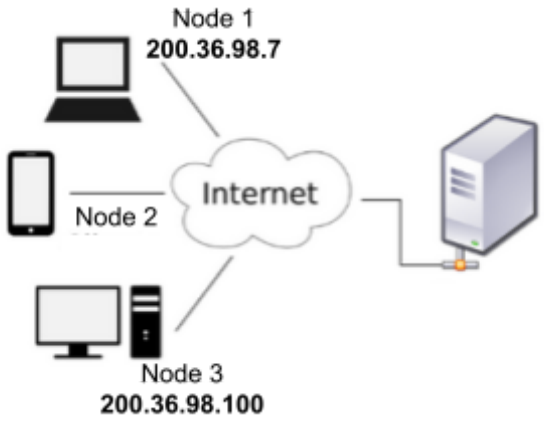


FIGURE 2

i. Give **one (1)** characteristic of IPv4.

[1 mark]

The IPv4 address consists of 4 groups of numbers

Each group separated by a period (dot)

The number in each group is between 0 and 255.

Uses 32 bits of address size.

Can accommodate 2^{32} unique addresses

ii. Give **one (1)** valid example of IP address for **Node 2**.

[1 mark]

200.36.98.99

iii. Nowadays, IPv6 is being used widely to identify the location of each node connected to the Internet. Explain **one (1)** reason why IPv6 is used instead of IPv4.

[2 marks]

As the number of computers and devices being **connected to the Internet are increasing** day by day, more addresses are required which eventually will **not be able to be accommodated by IPv4** --2 32: Allows for about 4.2 billion IP addresses.

Therefore, **IPv6** has been developed to rectify the problem since the lengthened address, **can accommodate more IP addresses**

(2^{128} : Allows for about 3.4 x 10^{38} IP addresses).

c.

i. **FIGURE 3** shows the relationship between IP Address and domain name.

FIGURE 3

Explain the relationship between both.

[2 marks]

A domain name is a text-based name that corresponds to the IP address of a server.

OR

Domain name is a text version of IP address that corresponds to a web server.

ii. Below is the URL for one of the websites.

`https://sites.google.com/view/korporat/home`

Identify

[2 marks]

Top Level Domain (TLD): .com

Pathname: /view/korporat/home

5.

a. Determine the area of computer ethics involved based on the given scenario.

[2 marks]

Scenario	Area of computer ethics
I. Sherry used a computer and network at her work place to download a movie file.	Codes of conduct
II. Chan tries to access other students' information from the college database. The information is only accessible by the academic department of the college.	Information Privacy

b. Linda received an email that made her feel happy. She wants to reply to the email and express her feelings. State **two (2) netiquette rules** she can follow when replying to the email.

[2 marks]

Use emoticons and emoji to express her emotion

Use meaningful subject lines in your email or webpage to reflect the content

Keep messages brief and clear

Read the message before you send it to determine usage of proper grammar, spelling, and punctuation.

Be polite, avoid offensive (unpleasant) language

6. System Development Life Cycle (SDLC) is a structured process that enables the production of high-quality, low-cost software, in the shortest possible production time.

a. Identify the phase and the suitable deliverables for that phase based on the scenario given below.

[4 marks]

Scenario	SDLC Phase	Deliverable
"I interviewed some of the employees in the Financing Department in Company ABC to find out how their current system works."	Analysis	Preliminary Investigation result Result form survey/ questionnaire/ data gathering/ observation
"For the time being, the new system will be used by our headquarters. Other branches will start using the system early 2025."	Implementation	New / modified system

b. Explain **one (1)** major activity in the SDLC phase given below.

[4 marks]

SDLC Phase	Major Activity
Planning	Review and approve project requests steering committee received projects request from users either to build a new or modify existing information system Prioritize project requests -evaluates the remaining project requests based on their value to the organization. -approves some projects and rejects others. Allocate resources Steering committee allocate resources such as money, people and equipment to approved projects Form project development team Form a project development team for each approved projects consisting of system analyst, IT specialist as well as users. Choose any one activity and explanation - J2 State Activity Only - J1
Support and Security	Perform maintenance activities fixing errors in, as well as improving system operations. Monitor system performance System analyst determine whether the system is inefficient or unstable at any point Assess system security Chief security officers develops a computer security plan that protect the organization's information assets Choose any one activity and explanation - J2 State Activity Only - J1

END OF QUESTION PAPER