PraPSPM MODEL 2023 - KMK

1 (a) Given the steps to pay electricity bills using eWallet. Analyze the use of the information processing cycle in the following scenario.

1. Log in to the e-Wallet app or key in your phone number and password to create your e-wallet account, if you haven't already.
2. Tap on the "Bills" tile and select biller "TNB".
3. Enter the TNB account number and payment amount.
4. Click "Submit".

[6 marks]

Operations	Explanation	Device
Input	→Read the phone number and password entered by the user. →Read payment details (biller, payment amount) entered by user →Read the TNB account number entered by user	→Keyboard →Touch screen monitor
Process	→Verifies phone number and password. →Verifies account number →Determine the **bill** amount based on account number entered by user →Calculate the current balance after payment by subtracting the payment amount with bill amount	→CPU →Processor →Central Processing Unit
Output	→Display payment confirmation →Display receipt/payment detail →Display current balance after payment	→Monitor →SmartPhone Screen →Touch screen monitor
Storage	→Save payment information. →Save transaction history →Store balance after payment deduction	→Server storage →Hard disk

J1 for Explanation
J0.5 for each Device

(ii) $1FA_{16}$ is NOT divisible by 101_2. Prove it.

$1\ F\ A_{16} = (1 \times 16^2) + (15 \times 16^1) + (10 \times 16^0) = 506$

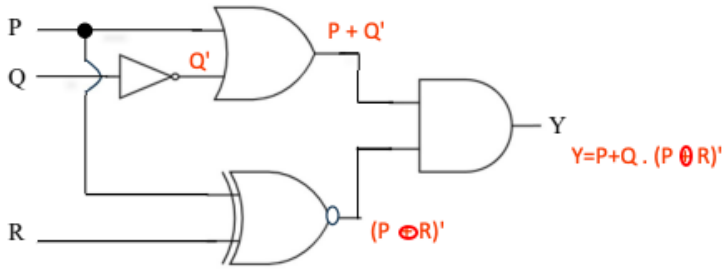
$101_2 = (1 \times 2^2) + (1 \times 2^0) = 5$

506 % 5 = 101 remainder 1, hence indivisible

2. A logic circuit is a physical or electronic arrangement of interconnected components designed to perform logical operations on binary data. Logic circuits are fundamental building blocks of digital electronics, and they process information in the form of binary (0s and 1s) using a set of logic gates.

(a) Derive Boolean expression based on the logic circuit below.

[5 marks]



Y = (P + Q') . (P ⊙ R)
OR
Y = (P + Q') . (P ⊕ R)'

(b) (i) Students must attend an assembly of solidarity for Palestine. If the weather is clear the assembly will be held in front of the pavilion. Otherwise, the assembly will be held in the big hall. Please wear the complete uniform according to your respective uniformed unit.

Derive the Boolean expression from the given scenario.

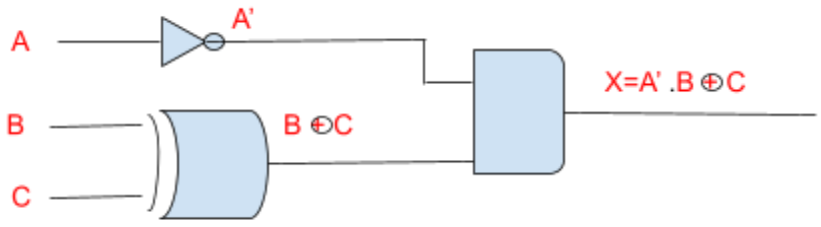
[3 marks]

Y – Attend assembly
P – held at pavilion
H – held at hall
U – wear uniform

Y = (P ⊕ H) . U

(c) X = A' . B ⊕ C For the given Boolean expression,

(i) Draw a logic circuit. [4 marks]



J1 → for each gate
J1 → correct label for each output gate

(ii) Construct the truth table.

[6 marks]

A	B	C	A'	B⊕C	X = A'.B⊕C
0	0	0	1	0	0
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	1	0	0
1	0	0	0	0	0
1	0	1	0	1	0
1	1	0	0	1	0
1	1	1	0	0	0

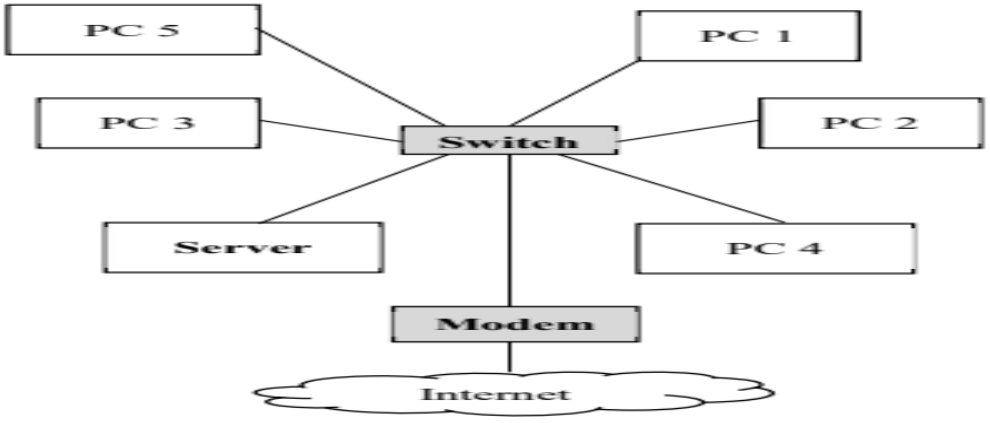
3 (a) "A well-known printing company based in Jitra, Kedah has one manager, four designers and 10 photographers. All photographers are not attached to the office but will be on site according to the designated location. All staff access and use the same storage. Designers will create templates and designs while photographers will use them to produce the best output."

(i) Propose an appropriate network architecture for the above situation. [1 mark]
Client-server architecture

(ii) Give one (1) advantage of architecture mentioned above. [1 mark]

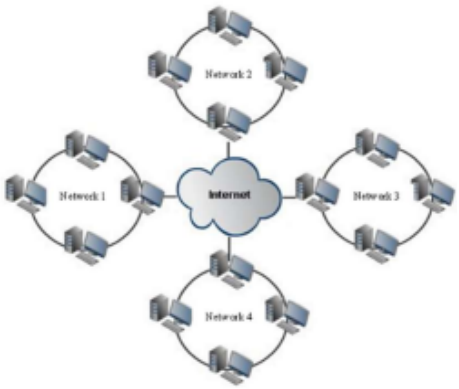
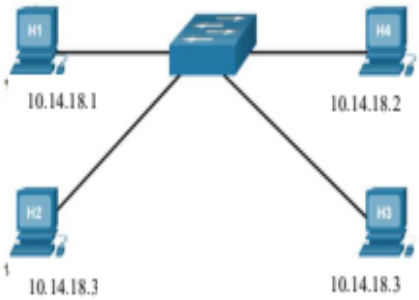
→Efficient for large networks and does not tend to slow down with heavy use.
→All the data is stored to the servers which generally have far greater security controls than most clients.
→Data backup and recovery is easier since all data is stored in the server.
J1 for each answer

(iii) Illustrate types of network architecture of the office at Jitra. [5 marks]



(b) Identify the appropriate network classification, coverage and ownership based on the diagram below.

[6 marks]

Diagram	Network Classification	Network Coverage	Network Ownership
(i) 	Wide Area Network (WAN)	Connect computer and devices in wide geographical areas such as multinational company	Multiple / shared ownership
(ii) 	Local Area Network (LAN)	Connect computer and devices in limited geographical area such as in a building/ home/ office/ school	Owned by Individual or single organization

(c) Given two versions of Internet Protocol (IP) address as below:

X	Y
192.168.0.11	fc01::2b44:23d0:89aa:7a50

Explain two (2) advantages of Y over X.

[2 marks]

→ IPv6 is 128-bit addresses, hence has a larger number of unique addresses (2^{128}) to accommodate more computer and devices compared to IPv4 which is 32-bit addresses (only 2^{32} unique addresses).

(d) Fetty surfed the website using two different techniques as shown below.

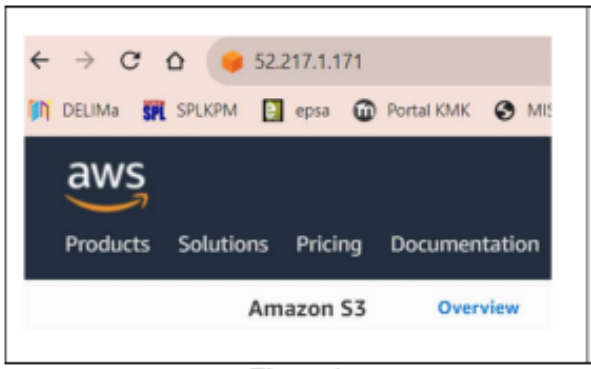


Figure 1

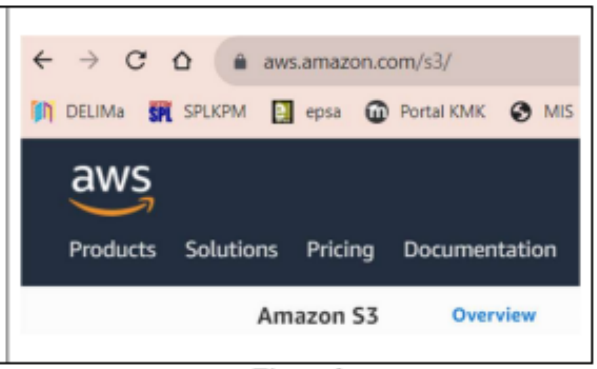


Figure 2

Explain the relationship between URL in Figure 1 and URL in Figure 2.

[4 marks]

Figure 1 – IP address

Figure 2 – Domain name

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

OR

A domain name is the portion of a URL or email address that identifies one or more IP addresses

6. Identify and explain the phase of the Software Development Life Cycle (SDLC) based on the given statements.

[8 marks]

Statement	Phase	Explanation
Identify the safeguards for each risk to detect, prevent, and recover from a loss or damage.	Support and Security	Provides ongoing assistance for an information system and its users after the system is implemented.
Use data gathering technique; mostly interview employees and review documentation.	Analysis	Used to determine the exact nature of the problem or improvement to be made and decide whether it is worth pursuing.
The system that has been developed is used in one department only in a set period of time.	Implementation	Construct the new or modified system, and deliver it to the user.
The systems analyst carefully designs every menu, screen, and report specified in the requirements.	Design	Acquire hardware and software needed and to create the detailed design of the new or modified information system.

END OF QUESTIONS

KERTAS SOALAN TAMAT