

SC015

Computer Science 1
Semester I
Session 2023/2024
2 hours

SC015

Sains Komputer 1
Semester I
Sesi 2023/2024
2 jam

No. Matrik Matric No.									

No. Kad Pengenalan Identity Card No.									

(Isikan maklumat dengan lengkap)

No. Tempat Duduk Seat No.			



KEMENTERIAN PENDIDIKAN MALAYSIA

KOLEJ MATRIKULASI KEDAH
KEDAH MATRICULATION COLLEGE

SCORE A PSPM 2023
PSPM MODEL 2023

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU.

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

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Untuk Kegunaan Pemeriksa For Examiner's Use		
No. Soalan Question No.	Markah Mark	
	Pemeriksa Examiner	KP / KKP
1	25	
2	18	
3	13	
4	12	
5	4	
6	8	
JUMLAH TOTAL	80	

Kertas soalan ini mengandungi **12** halaman bercetak.

This question paper consists of 12 printed pages.

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

1. Log in to 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	The e-Wallet system accept the phone number and password	Touch input
Process	The e-Wallet system calculate the amount of the bill	Microphone
Output	The e-Wallet system display the bill on the screen	Monitor
Storage	The e-Wallet system save the bill in history for future use.	Memory card

- (b) Number systems are methods of representing and expressing numbers. In mathematics and computer science, different number systems are used to represent numbers in various ways.

Calculate the following:

- (i) $11010101_2 - 1E_{16}$. Give your answer in binary value.

[6 marks]

$$\begin{array}{cccccccc}
 1 & 1 & 0 & 1 & 0 & 1 & 0 & 1 \\
 2^7 & 2^6 & 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \\
 1 \times 2^7 & 1 \times 2^6 & 0 \times 2^5 & 1 \times 2^4 & 0 \times 2^3 & 1 \times 2^2 & 0 \times 2^1 & 1 \times 2^0 \\
 128 + 64 + 0 + 16 + 0 + 4 + 0 + 1 \\
 = 213_{10} \\
 1 & E \\
 1 & 14 \\
 1 \times 16^1 & 14 \times 16^0 = 30_{10} \\
 16 + 14
 \end{array}$$

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

[7 marks]

$$\begin{array}{ccc}
 1 & F & A \\
 1 & 15 & 10 \\
 1 \times 16^2 & 15 \times 16^1 & 10 \times 16^0 \\
 256 + 240 + 10 \\
 = 506_{10} \\
 1 & 0 & 1 \\
 2^2 & 2^1 & 2^0 \\
 1 \times 2^2 & 0 \times 2^1 & 1 \times 2^0 \\
 4 + 0 + 1 \\
 = 5_{10} \\
 506_{10} \neq 5_{10} \\
 \therefore 1FA_{16} \text{ is not divisible by } 101_2
 \end{array}$$

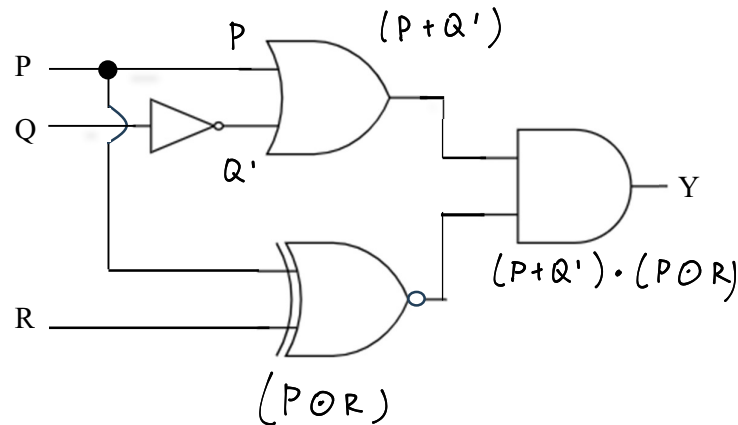
- (c) Differentiate the coding system based on number of bits and total number of characters represented and context use.

[6 marks]

	EBCDIC	Unicode
No. of bits	8	16
No. of characters	$2^8 = 256$	$2^{16} = 65536$
Context use	High-end server	Windows

- 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 logic circuit below.



$$Y = (P + Q') \cdot (P \oplus R)$$

[5 marks]

- (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]

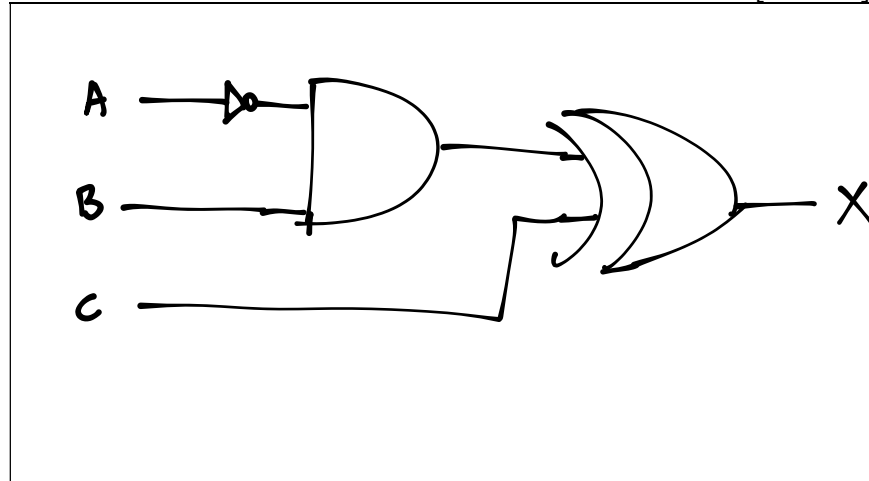
$$Y = (A + B) \cdot C$$

(c) $X = A' \cdot B \oplus C$

For the given Boolean expression,

- (i) Draw a logic circuit.

[3 marks]



- (ii) Construct the truth table.

[5 marks]

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

- 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

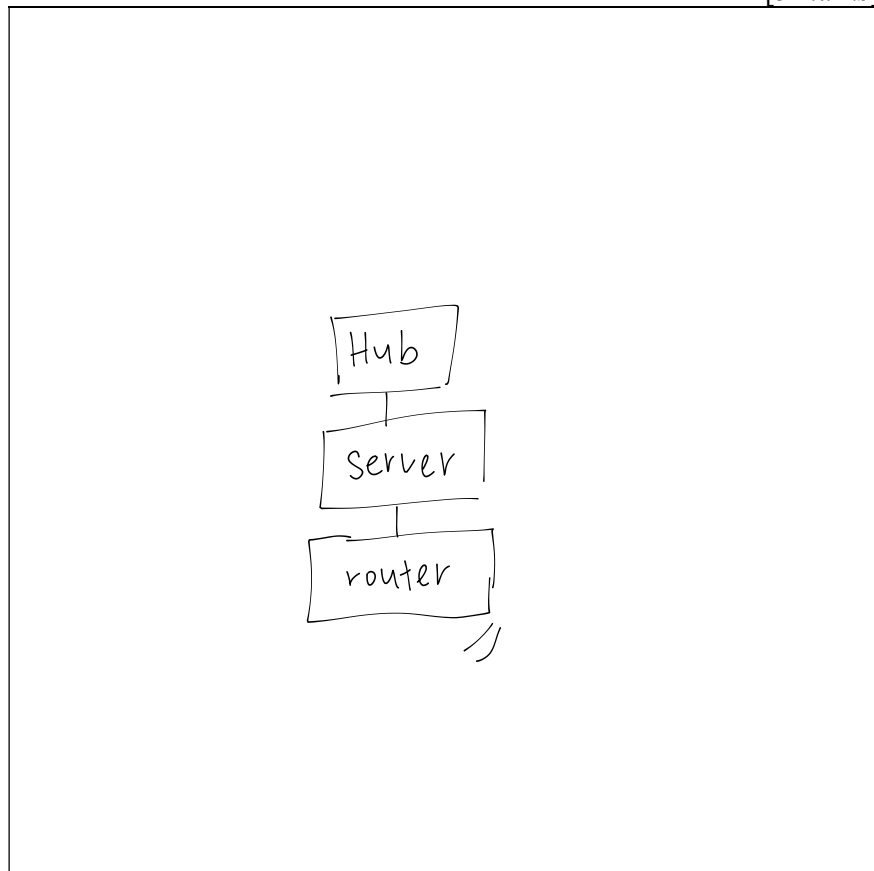
- (ii) Give **one (1)** advantage of architecture mentioned above.

[1 mark]

Can have password to own individual profiles

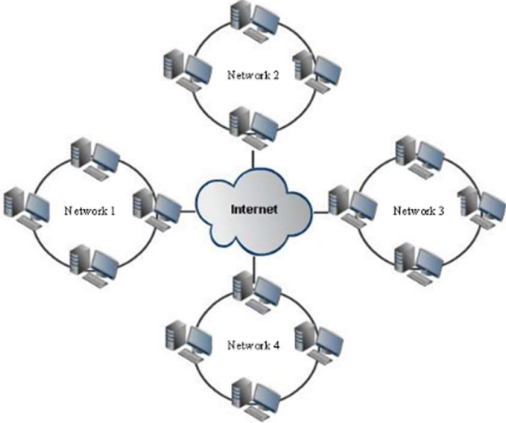
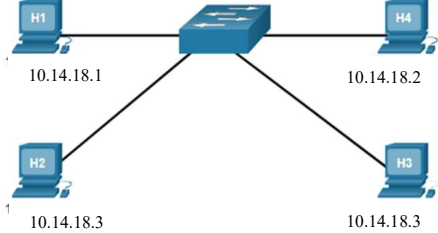
- (iii) Illustrate types of network architecture of the office at Jitra.

[5 marks]



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

[6 marks]

Diagram	Network Classification	Network Coverage	Network Ownership
<p>(i)</p> 	<p>WAN</p>	<p>Geographical covered area</p>	<p>collective or distributed ownership and individual</p>
<p>(ii)</p> 	<p>LAN</p>	<p>limited covered area</p>	<p>personal or one organization</p>

- 4 (a) LangkaSuka Water Filter Sdn. Bhd. would like to develop a shared calendar digitally so that it easier for all employees to stay up-to-date about company events. Employees can tell at a glance which events are coming up whether they are based in the main office or the warehouse.

- (i) Identify the type of network standard based on given scenario.

[1 mark]

Extranet

- (ii) Explain the type of network mentioned above.

[1 mark]

Is an extension of intranet to some entities outside the organization or company

- (b) Differentiate between Intranet and Extranet in terms of user accessibility.

[4 marks]

Intranet	Extranet
single organization	single or multiple organization

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

X IPv4	Y IPv6
192.168.0.11	fc01::2b44:23d0:89aa:7a50

Explain **two (2)** advantages of Y over X.

[2 marks]

Y is more security than X

Increase the available number of IP addresses exponentially

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

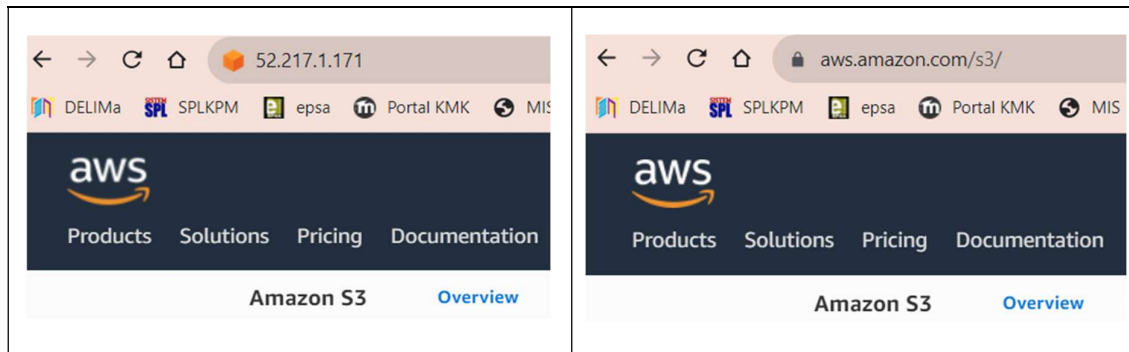


Figure 1

Figure 2

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

[4 marks]

Figure 2 is domain name system while Figure 1 is IP address.

Domain name system is a text version of IP address while IP address is a number version of domain name system.

Domain name system is more easy to remember than IP address

- 5 (a) Identify the area of computer ethics based on the given scenario.

[2 marks]

	Scenarios	Area of computer ethics
(i)	Abu Bakri brought some biscuits into the computer lab because he didn't have time for breakfast that morning.	Green computing
(ii)	A computer with a long-lasting battery does not need to be charged as often. This means that the computer does not need a large amount of electricity and ultimately becomes a more energy efficient and sustainable device.	Green computing

- (b) Study the situation given below.

“While communicating online, you have the right to disagree with someone else’s opinion, but try to keep the discussion healthy and don’t say anything you might regret later. If you get into a conversation including insulting, aggression with profanity, and other types of coarse language, take a deep breath and leave immediately.”

Suggest **two (2)** rules of netiquette that should be practiced in the above situation.

[2 marks]

Be polite

Do not use all capital letters

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

[8 marks]

	Statements	Phase	Explanation
(a)	Identify the safeguards for each risk to detect, prevent, and recover from a loss or damage.	Support & security	
(b)	Use data gathering technique; mostly interview employees and review documentation.	Analysis	
(c)	The system that has been developed is used in one department only in a set period of time.	planning	
(d)	The systems analyst carefully designs every menu, screen, and report specified in the requirements.	Design	

END OF QUESTIONS
KERTAS SOALAN TAMAT