

SC025
COMPUTER SCIENCE
SEMESTER I
SESSION 2023/2034
2 HOURS

SC025
SAINS KOMPUTER
SEMESTER I
SESI 2023/2024
2 JAM

Name/ Nama	Matric Number / Nombor Matrik	Class/ Kelas

Please provide complete and clear information.
Sila isi maklumat dengan lengkap dan jelas.



KOLEJ MATRIKULASI LABUAN
LABUAN MATRICULATION COLLEGE

PRE-PEPERIKSAAN SEMESTER PROGRAM MATRIKULASI
MATRICULATION PROGRAMME PRE-EXAMINATION

SAINS KOMPUTER
2 JAM

JANGAN BUKA KERTAS SOALAN SEHINGGA DIBERITAHU.
DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

Kertas soalan ini mengandungi 10 halaman bercetak
This question paper consists of 10 printed pages

- 1 (a) Identify the operation code and the shape of the information processing cycle based on the activities given in the scenario.

"This week, Ali has to write a report about three security threats and measures. He uses the chatGPT chatbot to find related ideas and information about the topic. Generally, this is the main activity to generate responses to Ali's question.

Operation Code	Activities
B	Input is pre-processed to clean and format the text including removing extra spaces, and converting text to lowercase
C	Receives the user's question or input in the form of text or speech
D	chatGPT analyses the context of the conversation to understand the user's intention from previous messages to provide meaningful responses
E	Data related to the current session are temporarily stored to help maintain context and provide coherent responses within the current session
F	The final response is delivered to the user through appropriate channels, such as a chat interface, voice assistant, or any other medium

[8 marks]

Operation	Operation Code	Operation Shape
Input		
Process		
Storage		
Output		

- (b) Convert 101001_2 into a decimal number. Show your calculation.

[3 marks]

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(c) Convert 4986_{10} into a binary number. Show your calculation.

[3 marks]

(d) Convert $1010F20F30_{16}$ to a binary number. Show your calculation.

[4 marks]

(e) Convert 1010_{10} to a hexadecimal number. Show your calculation.

[4 marks]

- (f) EBCDIC, Extended ASCII, and Unicode are the common types of coding scheme that uses binary as data representation in the computer. Every phrase and instruction will be stored as a bit in the memory/storage.

- (i) Calculate the number of bits for the phrase **20/5*24** in EBCDIC. Show your calculation.

[2 marks]


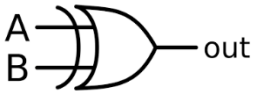
- (ii) How many bytes of 4-digit hexadecimal in Unicode. How many bytes of 4-digit hexadecimal in Unicode? (Given 4-digit Hexadecimal = 1 character Unicode)

[1 mark]

- 2 Logic gates serve as the elemental building blocks that underpin the digital logic and binary operations crucial for information processing, enabling a wide range of logical and arithmetic functions

- (a) Based on the given Boolean expression, name the gates and construct the truth tables.

[8 marks]

	Combinational Gates	Name	Truth Table
(i)			
(ii)			

- 3 (a) An **X Berhad** is looking to implement a local email system for its employees. The organization needs a solution that provides centralized email storage and management, strong security features, and the ability to handle a large volume of emails efficiently.

(i) Suggest the suitable network architecture for the **X Berhad** e-mail system.

[1 mark]

(ii) Describe the reason for your suggestion in **question (a)(i)**

[1 mark]

(iii) The X company also provides their staff with an Internet network. One server (Server 1) serves as a gateway between the internal network and the Internet. Another server (server 2) is dedicated to handling the local email system for **X Berhad**. Draw the network architecture for **X Berhad** with 3 workstations, 1 personal computer, servers, and any suitable communication device

[5 marks]



- (b) Identify the appropriate network classification, area of coverage, and ownership based on the following scenarios.

[6 marks]

Scenario	Network Classification	Network Area of coverage	Network Ownership
You are working in company A with 50 employees. Communication between employees mostly via the internal comm board system which can be accessed within the same building. The system has been developed to offer internal communication, reliable chat, and discussion room between the employees, and can attach any type of media.			
Company B has thousands of employees, to streamline communication and collaboration across its global presence, the company requires a robust email system to ensure seamless communication among employees from different offices and locations spread across the continent			

- 4 (a) Identify the network based on the scenario.

- (i) ACME Corporation allows its key supplier, Smith Metalworks, to access a secure online system. Through this system, Smith Metalworks updates raw material availability, receives purchase orders, and shares delivery schedules. They also access important documents like quality standards and product specifications. This system promotes efficient communication and collaboration in supply chain management for ACME.

[2 marks]

- (ii) At XYZ Corporation, Lisa, the finance manager, is responsible for managing budgets, approving expenses, and generating financial reports. She uses a network accessible only to employees for these tasks. This network also allows employees to submit expense claims and access financial documents, serving as a hub for financial management and communication at the company.

[2 marks]

- (b) (i) Give two (2) characteristics of IPv4 that distinguish it from IPv6. [2 marks]

Characteristic	IPv4
First characteristic	
Second Characteristic	

- (ii) Provide an example of an IPv6 address. [1 mark]

- (iii) What is the primary reason for the shift from IPv4 to IPv6? [1 mark]

- (c) Answer the following questions based on the URL given:

<https://www.nasa.gov.us>

[2 marks]

- (i) What do the domain name and gTLD indicate about the website's content and origin?

[2 marks]

- (ii) In the given URL, what is the purpose of the "www" subdomain, and what does the "https" protocol signify?

[2 marks]

- 5 (a) Based on the following scenarios, identify the area of computer ethics involved.

[2 marks]

Scenario	Areas of Computer Ethics
Amir, an independent musician, has recently released an original song on various digital music platforms. The song has gained popularity, and Alex is starting to receive recognition for their work. However, Alex soon discovers that their song has been uploaded to a popular video-sharing platform by an anonymous user without their permission.	
Puan Ainun, a concerned parent, is researching online to find information about the nutritional requirements of her child, who has food allergies and dietary restrictions. While searching for information on a popular health and nutrition website, she comes across a blog post that claims to offer expert advice on managing food allergies in children.	

- (b) What is the purpose of using smiley and abbreviations in your sentences while posting a message on your social media?

[2 marks]

	Purpose
Smiley	
Abbreviation	

- 6 XYZ Healthcare Center is currently using an on-premises electronic health records (EHR) system to manage patient records and appointments. The center's management has decided to migrate the EHR system to a cloud-based platform to improve accessibility, scalability, and data security.

Based on the given scenario, list **one (1) activity** and **one (1) deliverable** for each of the following phases of the System Development Life Cycle (SDLC).

[8 marks]

Phase of SDLC	Activity	Deliverable
Planning		
Analysis		
Design		
Implementation		

END OF QUESTION