SECTION B: 55 MARKS

BAHAGIAN B: 55 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** structured questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **DUA (2)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C1

(a) List **TWO (2)** examples of linear data structures.

*Senaraikan **DUA (2)** contoh struktur data linear.*

[2 marks]

[2 markah]

CLO2
C1

(b) State **TWO (2)** importance of an array.

*Nyatakan **DUA (2)** kepentingan array.*

[2 marks]

[2 markah]

CLO1
C2

(c) Identify the items labeled a, b and c based on **Figure B1**.

*Kenalpasti item-item yang berlabel a, b dan c berdasarkan **Rajah B1**.*

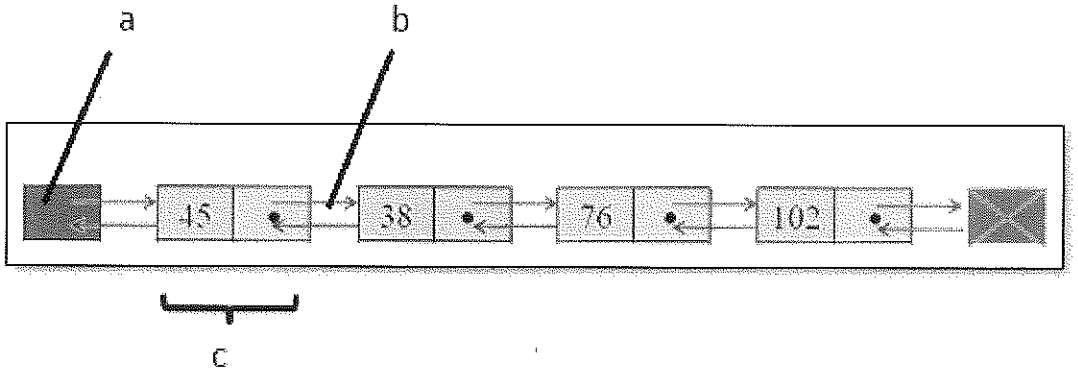

Figure B1 / *Rajah B1*

[3 marks]

[3markah]

CLO2
C2

(d) Differentiate between the list and the linked list in the data structure and give **ONE (1)** example for each differences.

*Bezakan antara senarai dan senarai terkaitan dalam struktur data dan berikan **SATU (1)** contoh untuk setiap perbezaan.*

[3 marks]

[3 markah]

CLO2
C3

(e) Illustrate a diagram for each of the following statement by using Linked List Data Structure as shown in **Figure B2**.

*Ilustrasikan gambarajah bagi setiap pernyataan menggunakan senarai berpaut struktur data seperti ditunjukkan pada **Rajah B2**.*

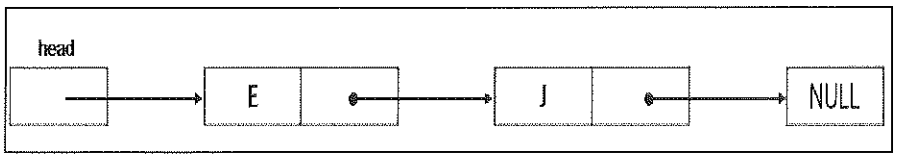

Figure B2 / *Rajah B2*

i. 'T' is being inserted as a second node.

'T' dimasukkan sebagai nod kedua.

ii. The tail is being deleted .

Buang ekor

[4 marks]

[4 markah]

CLO1
C1

(f) Define the underflow concept in the stack and draw the underflow diagram.

Takrifkan konsep underflow dalam tindanan dan lukiskan gambarajah underflow tersebut.

[3 marks]

[3markah]

CLO3
C3

(g) Illustrate a stack diagram for each of the operation below. Assume that the size of stack is 3.
Ilustrasikan gambarajah tindanan untuk setiap operasi di bawah. Anggapkan bahawa saiz tindanan adalah 3.

i. Push (8);
ii. Push (34);
iii. Pop ( );
iv. IsFull

[4 marks]
[4 markah]

CLO3
C4

(h) **Figure B3** shows the current stack within their values.
Rajah B3 *menunjukkan tindanan semasa bersama dengan nilai-nilainya.*

[3]	
[2]	"Durian"
[1]	"Banana"
[0]	"Mango"

Figure B3 / *Rajah B3*

i. Illustrate the stack as shown in **Figure B3** by using the Linked List implementation.
*Ilustrasikan tindanan seperti **Rajah B3** menggunakan perlaksanaan senarai berpaut.*

ii. Illustrate the operation of push("Rambutan");
Laksanakan operasi push("Rambutan");

iii. Illustrate the operation of push("Lemon");
Laksanakan operasi push("Lemon");

iv. Illustrate the operation of pop();
Laksanakan operasi pop();

[4 marks]
[4 markah]

QUESTION 2

SOALAN 2

CLO1 C2

(a) The queue using arrays has a major limitation. To overcome this problem, the Y method was introduced. Identify and describe the method.
Baris gilir menggunakan tatasusunan mempunyai batasan utama. Untuk mengatasi masalah ini, kaedah Y diperkenalkan. Kenal pasti kaedah Y dan terangkan kaedahnya.

[2 marks]
[2markah]

CLO3 C3

(b) Demonstrate a queue diagram by using an array to perform the operation below. Label the front and back for each diagram. Assume the size of queue is 3.
Demostrasikan rajah baris gilir menggunakan array untuk melaksanakan operasi di bawah. Labelkan depan dan belakang untuk setiap rajah. Anggap saiz baris gilir adalah 3.

i. Enqueue (90, &ABCqueue);
ii. Enqueue (17, &ABCqueue);

[4 marks]
[4 markah]

CLO3 C4

(c) Draw an appropriate circular queue diagram for each of the statement below. Show front, back and count based on a relevant diagram.
Lukis gambarajah baris gilir circular yang sesuai untuk setiap pernyataan di bawah. Tunjukkan depan, belakang dan bilangan mengikut gambarajah yang berkaitan

i. `Create CircularQueue(Q); Size = 3`
ii. `Enqueue(3,Q);`
iii. `Enqueue(7,Q);`
iv. `Dequeue(Q);`

[4 marks]
[4 markah]

CLO1
C2

(d) Based on **Figure B4**, identify the following nodes:

*Berdasarkan **Rajah B4**, kenalpasti nod berikut:*

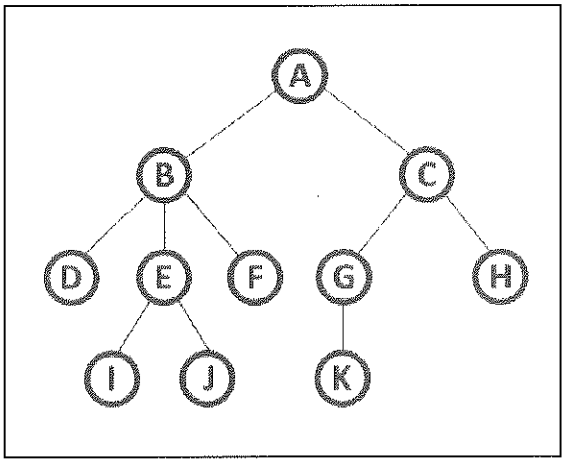

Figure B4 / *Rajah B4*

i. Leaves

Daun

ii. Parents

Ibu bapa

[2 marks]

[2 markah]

CLO3
C3

(e) Given stacks as **Figure B5** below:

*Diberi tindanan seperti **Rajah B5** di bawah :*

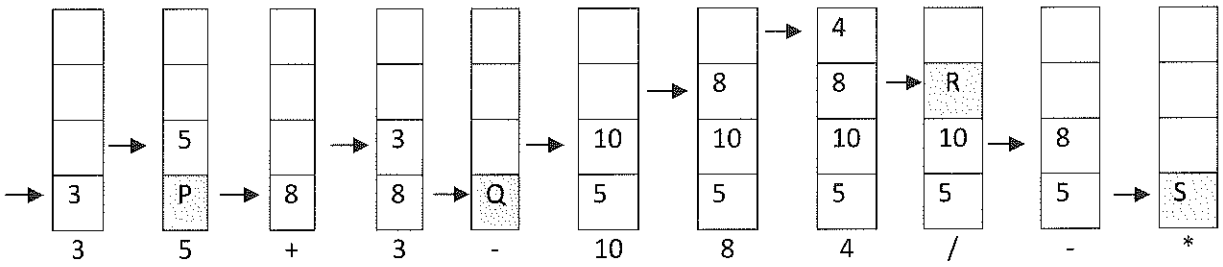

Figure B5 / *Rajah B5*

Illustrate the value of P, Q, R and S in the stacks.

Ilustrasikan nilai bagi P, Q, R dan S dalam tindanan.

[4 marks]

[4markah]

CLO3
C4

(f) Based on Figure B6, answer the following questions:
Berdasarkan Rajah B6, jawab soalan-soalan berikut:

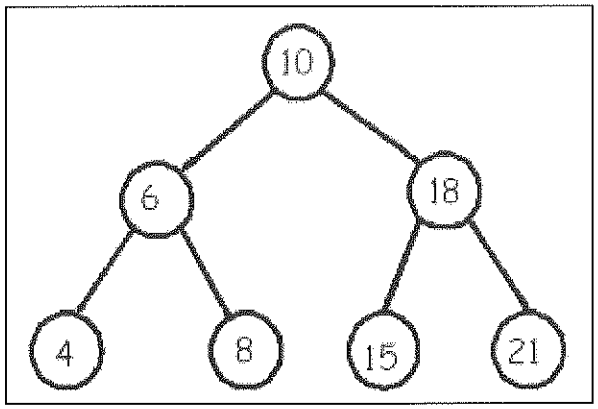

Figure B6 / *Rajah B6*

i. Draw the binary search tree after entering item 17.
Lakarkan pepohon carian binari selepas memasukkan item 17.

ii. Based on answer in (f)i, identify the node sequence of pre-order traversals.
Berdasarkan jawapan dalam (f)i, kenalpasti urutan nod bagi pre-order traversals.

[4 marks]
[4 markah]

CLO1
C2

(g) Differentiate between linear search and binary search method.
Bezakan antara kaedah carian linear dan carian dedua.

[2 marks]
[2 markah]

CLO3
C3

(h) Consider an array with the values as below:
Pertimbangkan nilai tatasusunan seperti di bawah:

Data list = { 9, 7, 5, 11, 12, 2, 14, 3, 10, 6 }

i. Sort the given number by using Quick sort. (Hint: Choose the first elements as a first pivot).
Susun nombor yang diberi menggunakan isihan Cepat.(Petunjuk: Pilih element pertama sebagai pivot pertama).

ii. List the value of pivot.
Senaraikan nilai pivot.

[4 marks]
[4 markah]

CLO3
C4

(i) Solve the target key 8 by using the linear search method based on the list of numbers given **{ 6, 1, 10 } .**
Selesaikan pencarian nombor 8 menggunakan kaedah carian linear berdasarkan senarai nombor yang diberikan ***{ 6, 1, 10 }.***

[4 marks]
[4 markah]

SOALAN TAMAT