SULIT

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

PEPERIKSAAN AKHIR

SESI II : 2023/2024

DFC30233 : DATA STRUCTURES

TARIKH : 07 JUN 2024
MASA : 8.30 PAGI - 10.30 PAGI (2 JAM)

Kertas ini mengandungi **SEMBILAN BELAS (19)** halaman bercetak.
Bahagian A: Objektif (30 soalan)
Bahagian B: Struktur (2 soalan)
Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

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 struktur. Jawab **SEMUA** soalan.*

QUESTION 1(a)
SOALAN 1(a)

CLO1

i. List **TWO (2)** differences between linear and non-linear data structures.

*Senaraikan **DUA (2)** perbezaan antara struktur data linear dan bukan linear.*

[2 marks]
[2 *markah*]

CLO1

ii. Based on the information in Figure B1(a)(ii), construct a structure declaration.

Berdasarkan maklumat dalam Rajah B1(a)(ii), bina pengisytiharan struktur.

Characteristic / *Ciri*	**Value / *Nilai***	**Type / *Jenis***
Structure Name / *Nama struktur*	Students	
Member 1 / *Ahli 1*	StudId	integer
Member 2 / *Ahli 2*	StudName	character size:50
Member 3 / *Ahli 3*	StudGender	character size: 1
Member 4 / *Ahli 4*	StudAge	integer
Variable / *Pembolehubah*	StudList - size: 10	

Figure B1(a)(ii) / *Rajah B1(a)(ii)*

[4 marks]
[4 *markah*]

QUESTION 1(b)
SOALAN 1(b)

CLO1 i. List the **TWO (2)** elements of a node in a Single Linked List.

*Senaraikan **DUA (2)** elemen nod dalam Senarai Berpaut Tunggal.*

[2 marks]
[2 *markah*]

CLO1 ii. Sketch the changes in linked list in Figure B2(b)(ii) for the following instructions.
a) node 15 is adding at middle between node 14 and node 16
b) node 16 is deleted.

Lakarkan perubahan senarai berpaut dalam Rajah B2(b) (ii) untuk arahan berikut.
a) nod 15 di tambah di tengah antara nod 14 dan nod 16
b) nod 16 di buang

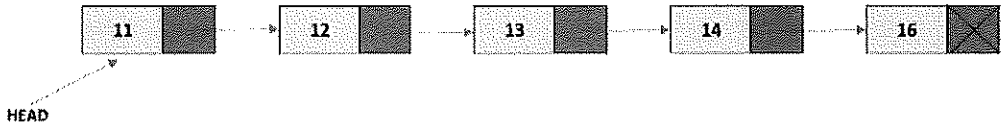

Figure B2(b)(ii) / *Rajah B2(b)(ii)*

[4 marks]
[4 *markah*]

QUESTION 1(c)
SOALAN 1(c)

CLO1 i. List **TWO (2)** ways of Stack implementation.

*Senaraikan **DUA (2)** cara pelaksanaan Tindanan.*

[2 marks]
[2 *markah*]

CLO1 ii. Explain the definition of top of the Stacks.

Terangkan definisi bahagian atas Tindanan.

[2 marks]
[2 *markah*]

CLO1

iii. Determine **FOUR (4)** basic operations of Stack.

*Tentukan **EMPAT (4)** operasi asas Tindanan.*

[4 marks]
[*4 markah*]

QUESTION 2 (a)
SOALAN 2 (a)

CLO1

i. List **FOUR (4)** examples of real-life implementation for Queue.

*Senarai **EMPAT (4)** contoh pelaksanaan kehidupan sebenar bagi Baris Gilir.*

[4 marks]
[*4 markah*]

CLO1

ii. Draw a complete diagram for each of the statements is executed based on Figure B2(a)(ii).

Lukiskan rajah yang lengkap selepas setiap pernyataan dilaksanakan berdasarkan Rajah B2(a)(ii).

30					
[0]	[1]	[2]	[3]	[4]	[5]

Figure B2(a)(ii) / *Rajah B2(a)(ii)*

Front = 0
Rear = 1

a. Enqueue (65)
b. Enqueue (35)
c. Dequeue ()
d. Enqueue (40)
e. Enqueue (55)
f. Dequeue ()

[6 marks]
[*6 markah*]

QUESTION 2 (b)
SOALAN 2 (b)

CLO1

i. State **FOUR (4)** leaves node based on the Figure B2(b)(i).

*Nyatakan **EMPAT (4)** nod daun berdasarkan Rajah B2(b)(i).*

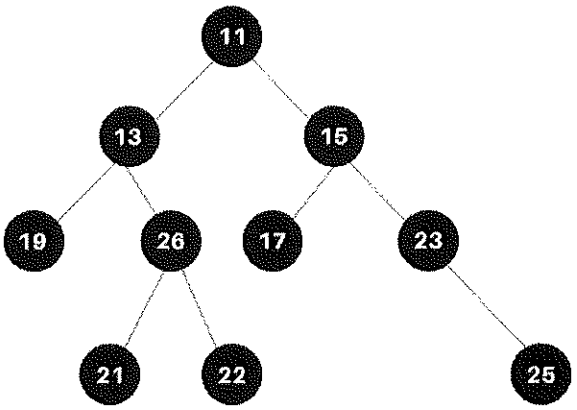

Figure B2(b)(*i*) / *Rajah B2(b)(i)*

[4 marks]
[*4 markah*]

CLO1

ii. Draw the Binary Tree for the following arithmetic expression.

Lukiskan Pepohon Dedua bagi ungkapan aritmetik berikut.

a) y - a * (b + w)
b) 2 * 2 + 3 – 8

[6 marks]
[*6 markah*]

CLO1

iii. Construct the Binary Search Tree based on Figure B2(b)(iii).

Bina Pepohon Carian Dedua berdasarkan Rajah B2(b)(iii).

K, E, R, C, M

Figure B2(b)(iii) / *Rajah B2(b)(iii)*

[6 marks]
[*6 markah*]

QUESTION 2 (c)
SOALAN 2 (c)

CLO1

i. Show the first **TWO (2)** steps in using Bubble Sort method for the following data.

*Tunjukkan **DUA (2)** langkah pertama menggunakan Isihan Buih bagi data berikut.*

5, 2, 4, 6, 1

[4 marks]
[*4 markah*]

CLO1

ii. Show the steps to find target key = 30 based on sequence number in Figure B2(c)(ii) by using Binary Search method.

Tunjukkan langkah untuk mencari kunci sasaran = 30 berdasarkan urutan nombor dalam Rajah B2(c)(ii) dengan menggunakan kaedah Carian Binari.

10	16	23	25	30	50	58

Figure B2(c)(ii) / *Rajah B2(c)(ii)*

[5marks]
[*5 markah*]

END OF QUESTION
SOALAN TAMAT