

SECTION A: 60 MARKS***BAHAGIAN A: 60 MARKAH*****INSTRUCTIONS:**

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1***SOALAN 1***CLO1
C1

- (a) List **THREE (3)** main functions of operating system.

Senaraikan TIGA (3) fungsi utama sistem pengoperasian.

[3 marks]

*[3 markah]*CLO1
C2

- (b) Explain the difference between system software and application software with an appropriate example.

Terangkan perbezaan antara perisian sistem dan perisian aplikasi dengan contoh yang bersesuaian.

[5 marks]

*[5 markah]*CLO2
C3

- (c) Operating System comprises a set of software packages that can be used to manage interactions with the hardware. Draw a diagram on how microkernel validates and passes the message between the components and get access to the hardware.

Pengoperasian Sistem mengandungi set pakej perisian yang boleh digunakan untuk menguruskan interaksi dengan perkakasan. Lukiskan gambarajah bagaimana 'microkernel' mengesahkan dan menghantar mesej antara komponen dan mendapat akses ke perkakasan.

[7 marks]

[7 markah]

QUESTION 2**SOALAN 2**

- CLO1
C2 (a) Identify **THREE (3)** types of the user interface.
*Kenal pasti **TIGA (3)** jenis pengantara muka pengguna.*
- [3 marks]
[3 markah]
- CLO1
C3 (b) There are **THREE (3)** types of disk interleaving. With the aid of diagram, illustrate the differences between each type.
*Terdapat **TIGA (3)** jenis cakera kemasukan. Dengan bantuan gambarajah, gambarkan perbezaan antara setiap jenis.*
- [6 marks]
[6 markah]
- CLO2
C3 (c) List **SIX (6)** steps involved on a personal computer boot up process after power supply sends a signal to components in systems unit.
*Senaraikan **ENAM** langkah yang terlibat semasa proses 'boot up' komputer peribadi selepas bekalan kuasa menghantar isyarat kepada komponen dalam unit sistem.*
- [6 marks]
[6 markah]

QUESTION 3

SOALAN 3

- CLO1
C2 (a) Describe the **Resident** and **Transient Routines** in operating system.
Terangkan rutin 'Resident' dan 'Transient' di dalam sistem pengoperasian.
- [3 marks]
[3 markah]
- CLO1
C3 (b) Illustrate **Dynamic Address Translation (DAT)** of segment using a diagram.
Ilustrasikan 'Dynamic Address Translation' (DAT) segmen dengan menggunakan gambarajah.
- [6 marks]
[6 markah]
- CLO2
C3 (c) By referring to a memory map in Figure 3C, assume a new process P4 comes with a memory requirement of 3 KB. Draw the resulting of memory maps after process P4 located in the memory map using the following algorithm:-
Merujuk kepada peta memory di dalam Rajah 3C, anggap proses P4 baru sampai dan memerlukan saiz ingatan 3 KB. Lukiskan hasil peta ingatan setelah proses P4 diletakkan di dalam peta memori dengan menggunakan algoritma berikut.
- i. first-fit / 'first fit'
 - ii. best-fit / 'best fit'
 - iii. worst-fit / 'worst fit'

OS
P1
<FREE> 10KB
P2
<FREE> 16KB
P3
<FREE> 4KB

Figure 3C / Rajah 3C

[6 marks]
[6 markah]

QUESTION 4

SOALAN 4

CLO1
C2

- (a) Identify
- FIVE (5)**
- scheduling algorithms in operating system.

Kenal pasti LIMA (5) algoritma penjadualan di dalam sistem pengoperasian.

[5 marks]

[5 markah]

CLO1
C2

- (b) Calculate average waiting time for the process in Table 4B by using
- First In First Out (FIFO)**
- scheduling with an aid diagram.

Kira purata masa menunggu bagi proses di dalam Jadual 4B dengan menggunakan penjadualan 'First In First Out (FIFO)' dengan bantuan gambarajah.

[5 marks]

[5 markah]

Table 4B / Jadual 4B

Process (Proses)	Arrival time (ms) (Masa Ketibaan)	Execution time (ms) (Masa Perlaksanaan)
A	0	2
B	4	4
C	6	2
D	7	4

CLO2
C2

(c) Figure 4C shows the Gantt chart of **Shortest Remaining Time First (SRTF)** scheduling. By referring to Figure 4C, calculate the arrival time and execute time for each process in Table 4C.

Rajah 4C menunjukkan carta gantt menggunakan penjadualan 'Shortest Remaining Time First'. Dengan merujuk Rajah 4C, kira masa ketibaan dan masa pelaksanaan untuk setiap proses di dalam Table 4C.

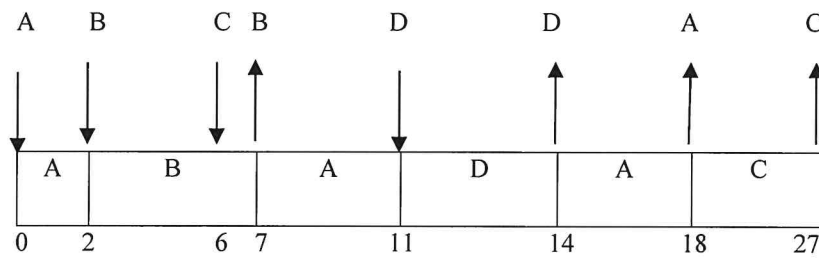


Figure 4C / Rajah 4C

Table 4C / Jadual 4C

Process	Arrival time (ms)	Execute time (ms)
A	0	?
B	?	?
C	?	?
D	11	3

[5 marks]
[5 markah]

SECTION B: 40 MARKS***BAHAGIAN B: 40 MARKAH*****INSTRUCTION:**

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

ARAHAN:

Bahagian ini mengandungi DUA (2) soalan esei. Jawab SEMUA soalan.

QUESTION 1***SOALAN 1***

CLO2
C3

Paging technique is one of the memory management methods. Let's say size of Process A is 6KB and every page has 2KB of data. With an aid of diagram, interpret the **FIVE (5)** steps of paging technique on how to store Process A in memory.

Teknik 'paging' adalah salah satu kaedah pengurusan memori. Katakan saiz Proses A adalah 6KB dan saiz setiap 'page' mempunyai 2KB data. Dengan bantuan gambarajah, tafsirkan LIMA (5) langkah teknik 'paging' bagaimana Proses A disimpan.

[20 marks]

[20 markah]

QUESTION 2**SOALAN 2**CLO2
C4

Ahmad wants to install a new operating system on his new computer. Analyze **FOUR (4)** installation methods that can be used to install the operating system in Ahmad's computer.

*Ahmad ingin memasang sistem operasi baru di dalam komputer yang baru dibelinya. Buat analisis **EMPAT (4)** kaedah yang boleh digunakan untuk memasang sistem operasi di dalam komputer Ahmad.*

[20 marks]

[20 markah]

SOALAN TAMAT