

**FINAL  
ALTERNATIVE ASSESSMENT**

(COVER PAGE)

Session : April 2022

Programme : DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)

Course : DCS1106: OPERATING SYSTEMS

Date of Examination : 04 August 2022(Thursday)

Time : 08.00am – 10.30am Reading Time : Nil

Duration : 02 hours 30 minutues

**Special Instructions :**

There are total of **FOUR (4)** questions. Answer all the questions. Each question carries 25 marks.

Material permitted : Non-Programmable Scientific Calculator

Materials provided : Nil

Examiner(s) : Usha Jayahkudy,Ryan Tee Ah Ann

Chief Moderator : Vasuky Mohanan

*This paper consists of 3 printed pages, including the cover page*

DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)  
DCS1106: OPERATING SYSTEMS  
FINAL ALTERNATIVE ASSESSMENT: APRIL 2022 SESSION

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**Question 1**

- (a) One of the objective of the operating system is ability to evolve. By using two different types of operating system as an example, explain **TWO (2)** reasons from each types of operating system on how the operating system has evolved in terms of being more fault tolerant. (10 marks)
- (b) With the aid of a diagram, explain how system calls are being invoked. The answer provided should be supported with a scenarios that occur within an operating system. (8 marks)
- (c) Operating system act as a resource allocator. Describe **ONE (1)** supporting reason to justify this statement. (2 marks)
- (d) Context switching is an example of software based interrupt or hardware based interrupt. By stating which type, explain **TWO (2)** reasons to support your answer. (5 marks)

**Question 2**

Given the following processes, burst times and arrival time in Table1:

Table 1: List of Process with Burst Time and Arrival Time

Process	Burst Time (ms)	Arrival Time (ms)
P1	6	2
P2	2	5
P3	8	2
P4	3	0
P5	4	4

The processes are assumed to have arrived based on the arrival time

- (a) Calculate the average waiting time, in ms, for each of the scheduling algorithm as below:

- (i) First Come, First Serve (7 marks)
  - (ii) Round Robin (quantum 2) (7 marks)
  - (iii) Shortest Job First, (preemptive) (7 marks)
- (b) Explain **TWO (2)** ways on how long term scheduler controls the degree of multiprogramming for the process selection. (4 marks)

### Question 3

- (a) Describe how the **THREE (3)** address scheme are being generated:
- (i) Symbolic Address
  - (ii) Relocatable Address
  - (iii) Absolute Address
- (6 marks)
- (b) Explain **TWO (2)** advantages and **TWO (2)** disadvantages of contiguous memory allocation scheme. (8 marks)
- (c) Paging and Segmentation are example of non-contiguous memory allocation scheme. Describe **THREE (3)** differences between paging and segmentation. (6 marks)
- (d) While OS servicing an interrupt, there are various kinds of performance overhead is associated with it. Hence, analyze any **TWO (2)** kinds of overhead when handling with interrupt. (5 marks)

### Question 4

- (a) With the aid of a diagram, explain how Direct Memory Access works. (12 marks)
- (b) From system security perspective, describe the **FOUR (4)** levels required to protect a system. Please provide an example for each method. (8 marks)
- (c) Discuss any **TWO (2)** solutions for preventing man-in-the middle attacks that occur in computer program (5 marks)

~THE END~