



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2012/2013**

COURSE NAME : BASIC OPERATING SYSTEM
COURSE CODE : DAT 10303
PROGRAMME : 1 DAT
EXAMINATION DATE : MARCH 2013
DURATION : 2 1/2 HOURS
INSTRUCTIONS : ANSWER **FOUR (4)**
QUESTIONS ONLY.
THREE (3) FROM SECTION A
AND ONE (1) FROM SECTION
B.

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

SECTION A

- Q1** (a) Define short-term, medium-term, and long-term scheduling. (3 marks)
- (b) Explain **THREE (3)** advantages of microkernel designs. (6 marks)
- (c) Discuss the differences between the client–server and peer-to-peer models of distributed systems. (5 marks)
- (d) Explain the different between System Call and Remote Procedure Call. (5 marks)
- (e) Describe briefly the features of the following operating system (6 marks)
- (i) Smart phone
 - (ii) Embedded system
 - (iii) Real time Operating system

- Q2**
- (a) Explain **TWO (2)** differences between batch processing and multiprocessing.
(4 marks)
 - (b) Explain the purpose of interrupts.
(3 marks)
 - (c) Explain the purpose of trap.
(3 marks)
 - (d) Explain the direct memory access (DMA) process.
(5 marks)
 - (e) Explain how does the CPU know when the memory operations are complete.
(5 marks)
 - (f) Describe an interference generated when CPU is allowed to execute other programs while DMA controller is transferring data.
(5 marks)

Q3 Consider the following set of processes queue list in table Q3, with the length of the CPU-burst time given in milliseconds (ms);

Table Q3: Process Queue

Process	Burst Time (ms)	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0 ms.

(a) Draw **FOUR (4)** Gantt charts illustrating the execution of these processes using FCFS, SJF, a non pre-emptive priority (note that smaller priority number implies a higher priority), and RR (quantum = 1 ms) scheduling.

(12 marks)

(b) Calculate the waiting time of each process for FCFS, SJF, a non pre-emptive priority, and RR scheduling algorithms.

(12 marks)

(c) State which of the algorithm is the shortest waiting time.

(1 marks)

SECTION B

Q4 (a) Discuss **THREE(3)** advantages of memory protections.

(6 marks)

(b) State a technique of memory protection for preventing a program from modifying a memory associated to other programs.

(2 marks)

(c) Describe briefly the purpose of memory paging.

(2 marks)

(d) The following segment table are given:

Table Q4(d): Memory Segments

Segment	Base	Length (or limit)
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

Calculate the physical addresses for the following logical addresses;

- (i) 0,430
- (ii) 1,10
- (iii) 2,500
- (iv) 3,400
- (v) 4,112

(15 marks)

- Q5** (a) List **FIVE(5)** services provided by an operating system that make it more convenient for the users.
- (10 marks)
- (b) Explain in what cases would be impossible for user-level programs to provide the services in Q5(a) above.
- (5 marks)
- (c) Discuss the following scheduling criteria conflict pairs;
- (i) CPU utilization and respond time
 - (ii) Average turnaround time and maximum waiting time
 - (iii) I/O devices and CPU utilization
- (6 marks)
- (d) Explain the scheduling approach below:
- (i) I/O bound scheduler
 - (ii) CPU bound scheduler
- (4 marks)

- END OF QUESTION -