



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTING AND IT

**DIPLOMA IN INFORMATION TECHNOLOGY (IF302/10)
(DIT MOD I)**

END OF SEMESTER EXAMINATIONS

APRIL/MAY 2010 SERIES

OPERATING SYSTEMS I

TIME: 2 hours

INSTRUCTIONS TO CANDIDATES

This paper has two Sections: **A** and **B**.

Answer all questions from Section **A** and any other **TWO** from Section **B**.

SECTION A

(a) Explain the following terms:

- (i). Firmware
- (ii). Booting
- (iii). Spooling
- (iv). Real-time systems

[8 marks]

(b) A variable partition memory system has at some point in time the following hole sizes in the given orders.

20k 15k 40k 60k 10k 25k

A new process is to be loaded of size 25k. Explain which hole size would be filled using Best-fit, First-fit and Worst-fit placement strategies respectively.

[6 marks]

(c) Distinguish between a program and a process

[4 marks]

(d) Explain the following process states:

- (i). Ready Suspended state
- (ii). Block Suspended state
- (iii). Running state

[6 marks]

(e) Distinguish between pre-emptive and non-pre-emptive scheduling algorithms

[4 marks]

(f) Outline two goals of disk scheduling strategies

[2 marks]

SECTION B

Question TWO

- (a). Keribo Ltd are contemplating between adopting Unix or Microsoft Windows operating systems. State three merits and demerits of each choice.
- [12 marks]
- (b). Explain the following performance criteria
- (i). Throughput
 - (ii). Turnaround time
 - (iii). Response time
 - (iv). Waiting time

[8 marks]

Question THREE

The following series of processes with the given estimated run-times arrive in the ready queues in the times shown respectively.

Job	AT	Burst
A	0	4
B	2	5
C	8	5
D	10	8
E	11	10

- (i). Draw the time Gantt charts for Round Robin (Time quantum of 4), SJF and SRTN algorithms.
- (ii). Compare the Average Waiting Time for the three algorithms and comment on your results.

[20 marks]

Question FOUR

- (a). Explain the main merit and demerit of the following memory management techniques:
- (i). Fixed partition

- (ii). Variable partition
- (iii). Variable partition with compaction
- (iv). Paging technique

[16 marks]

- (b). Outline Four characteristics which give rise to the wide variations in the nature of I/O devices

[4 marks]

Question FIVE

- (a). The performance of the disk system on a computer is often the most significant factor in determining the overall speed of an application. Discuss how the following techniques are applied to improve on the disk system.

- (i). Blocking
- (ii). Disk Caching
- (iii). RAID disks
- (iv). File re-organization

[16 marks]

- (b). Explain the term 'Device Independence' and indicate the contribution made by device drivers in this respect.

[4 marks]