THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION & COMMUNICATION TECHNOLOGY

OPERATING SYSTEMS 1

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

1. Explain the following terms:

a. Firmware

b. Booting

c. Spooling

d. Real-time systems

[8 marks]

2. 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]

3. Distinguish between a program and a process

[4 marks]

4. Explain the following process states:

a. Ready Suspended state

b. Block Suspended state

c. Running state

[6 marks]

5. Distinguish between pre-emptive and non-pre-emptive scheduling algorithms

[4 marks]

6. Outline two goals of disk scheduling strategies

[2 marks]

SECTION B

7. 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]

8. 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

a. Draw the time Gantt charts for Round Robin (Time quantum of 4), SJF and SRTN algorithms.

b. Compare the Average Waiting Time for the three algorithms and comment on your results.

[20 marks]

9. 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]

10. 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-organisation

[16 marks]

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

[4 marks]