THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY (BTech. ICT. 11M)

EIT 4109/ICS 2202: OPERATING SYSTEM I

END OF SEMESTER II EXAMINATION

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (*Compulsory*)

QUESTION 1 (30 marks)

a) Define the following terms

i. System call

ii. Coalescing

iii. IRQ

iv. System bus [4marks]

b) Explain the differences in the degree to which the following scheduling algorithms discriminate in favour of short processes. [4marks]

FCFS
RR

c) What are the **FOUR** major activities of the operating system in regards to process management [4 marks]

d) Differentiate between the following terms

i. System file and program file

ii. Cache and buffer

iii. Short term and long term scheduler

iv. Overlay and segmentation in memory management [8marks]

e) State and explain any **THREE** process states [3marks]

f) Get the average waiting time of the processes shown below using SJF algorithm with preemption [6marks]

Process	Burst Time	Arrival Time
1	11	0
2	23	1
3	3	2
4	8	3
5	1	4

g) Give the difference between preemptive and non preemptive scheduling [4marks]

SECTION B (*Attempt any TWO questions*)

QUESTION 2(20 marks)

a) Explain **FIVE** functions of an operating system [5marks]

b) Explain the following structure of an operating system

i. layered structure [5marks]

ii. The big mess [3marks]

iii. virtual machine [2 marks]

c) Schedule the jobs below using round robin algorithm with a time quantum of 4 seconds and calculate the average waiting time [5 marks]

Process	Burst Time	Arrival Time
1	20	0
2	7	1
3	12	2
4	3	3

QUESTION 3(20 marks)

a) State **SIX** types of operating systems and explain how they differ [6marks]

b) State and explain **THREE** types of file organization giving 2 advantages and 2 disadvantages of each. [10 marks]

c) Give **THREE** factors affecting choice of file organization [4marks]

QUESTION 4 (20 marks)

a) Explain **FOUR** conditions that lead to deadlock [8 marks]

b) Give any **THREE** deadlock recovery measures [5marks]

c) Give **TWO** challenges of monoprogramming [2marks]

d) Discus how multiprogramming without swapping is achieved [5marks]

QUESTION 5 (20 marks)

a) Discuss the **THREE** strategies used to allocate memory to a process their problems and merits [6marks]

b) Discuss **THREE** page swapping strategies [6marks]

c) State and explain the components of an i/o port [8marks]