



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:
BACHELOR OF TECHNOLOGY IN INFORMATION COMMUNICAITON
TECHNOLOGY (BTIT 14S)

EIT 4109/ICS 2202: OPERATING SYSTEMS

END OF SEMESTER EXAMINATION

SERIES: APRIL 2015

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Attempt question **ONE (Compulsory)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Define the following:

(i) Process

(ii) Process control block (PCB)

(iii) Multi Programming

(iv) Time Sharing

(8 marks)

b) Write down different system calls for performing different kind of tasks

(6 marks)

c) Differentiate between pre-emptive and non-preemptive scheduling

(4 marks)

d) CPU burst time indicates the time, the process needs the CPU. The following are the set of processes with their respective CPU burst time (in milliseconds) Process CPU-Burst time

P1 10

P2 5

P3 5

Calculate the average waiting time if the process arrived in the following order

(6 marks)

(i) P1, P2, & P3

(ii) P2, P3 & P1

e) What is a semaphore? Explain busy waiting semaphores (6 marks)

Question Two

a) Explain memory fragmentation (2 marks)

b) Explain the steps needed to perform page replacement (8 marks)

c) Explain an i/o buffer? (2 marks)

(i) Explain advantage of buffering in computer architecture

(ii) Explain using a diagram effectiveness of buffering (8 marks)

Question Three

a) Differentiate between protection and security. Explain the techniques for protection of user files. (6 marks)

b) Draw the state diagram of a process from its creation to termination, including all transitions and briefly elaborate every state and every transition (6 marks)

c) Consider the following set of jobs with their arrival times, execution time (in minutes) and deadlines:

Job Ids	Arrival time	Execution Time	Deadline
1	0	5	5
2	1	15	25
3	3	12	10
4	7	25	50
5	10	5	12

Calculate the mean turn-round time, the mean weighted turn-around time and the for FCFS, SJN and deadline scheduling algorithm (8 marks)

Question Four

a) Given memory partitions of 100K, 500k, 200k, 300k and 600k (in order), apply first fit and best fit algorithms to place processes with the space requirement of 212K, 417K, 112K and 426k (in order)? Which algorithm make the most effective use of memory? (6 marks)

b) (i) Define memory swapping
(ii) Explain how swapping increase the operating systems overheads (8 marks)

c) What are the disadvantages of FCFS scheduling algorithm as compared to shortest job first (SJF) scheduling? (8 marks)

Question Five

a) Differentiate between Batch Operating System and Time Sharing Operating System (6 marks)

b) Define critical section problem and give TWO solutions for critical section problem (8 marks)

c) Describe the necessary conditions for Deadlock (8 marks)