



# TECHNICAL UNIVERSITY OF MOMBASA

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## INSTITUTE OF COMPUTING AND INFORMATICS

### DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

#### UNIVERSITY EXAMINATION FOR:

#### DIPLOMA IN INFORMATION COMMUNICATION AND TECHNOLOGY

#### ECS 2106: PRINCIPLES OF OPERATING SYSTEM

#### END OF SEMESTER EXAMINATION

**SERIES:** AUGUST2019

**TIME:** 2HOURS

**DATE:** Pick Date Aug2019

#### Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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#### Question ONE

- a) Define operating system [2marks]
- b) explain four differences between paging and segmentation [4marks]
- c) explain the following scheduling algorithms in process management [8marks]
  - i. round robin
  - ii. priority scheduling
  - iii. first come first served
  - iv. shortest job first
- d) Explain the following file access mechanism [6marks]
  - i. Sequential access
  - ii. Direct/Random access
  - iii. Indexed sequential access

## Question TWO

- a) Explain the concept of virtual memory [4marks]
- b) Describe different approaches that can be used to avoid deadlock [8marks]
- c) Explain the difference between internal fragmentation and external fragmentation [4marks]
- d) Explain the following allocation algorithms. [4marks]
  - i. First Fit
  - ii. Best fit
  - iii. Worst fit
  - iv. Next fit

## Question THREE

- a) Explain the following [3marks]
  - i. Device controller
  - ii. Device driver
  - iii. A file
- b) Files are allocated disk spaces by operating system. Explain the following mechanisms that Operating systems uses to allocate disk space to files. [6marks]
  - i. Contiguous Allocation
  - ii. Linked Allocation
  - iii. Indexed Allocation
- c) Using an illustration, explain the process states [5marks]
- d) Explain computer clocking system [2marks]
- e) Explain the concept of direct memory access [4marks]

## Question FOUR

- a) Buffering of I/O is performed for at least 2 major reasons: explain [2marks]
- b) Differentiate between preemptive scheduling and non-preemptive scheduling [4marks]
- c) Assuming the operating system detects the system is deadlocked; explain different mechanism that can be used to recover from deadlock [4marks]
- d) Explain three Categories of I/O Devices [6marks]

e) Explain two types of schedulers

[4marks]

### Question FIVE

a) Assume we have the process arrival time chart given below. Assume that the quantum is set to 5 time units

Process	Arrival time	Execution time
P1	0	16
P2	1	10
P3	6	4
P4	8	6
P5	8	10

Draw a Gantt chart to illustrate how these processes would be scheduled using

- i. Round Robin (RR) [5marks]
- ii. First-come first-Served (FCS) scheduling [5marks]
- iii. Calculate the average waiting time for each scheduling algorithm [10marks]