



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

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AUGUST - DECEMBER 2016 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

REGULAR PROGRAMME

DIT 005: FUNDAMENTALS OF OPERATING SYSTEMS

Date: DECEMBER 2016

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and ANY other TWO Questions

- Q1. a) Briefly explain what you understand by the term Operating systems
(2 Marks)
- b) Give a description of the following terms in relation to operating systems
- i. Deadlock
 - ii. Inter process communication
 - iii. Multiprogramming
 - iv. Process
 - v. Dispatcher
- (10 Marks)**
- c) Briefly describe the following terms as used in operating systems
- i. Pre-emptive and non-preemptive scheduling
 - ii. Process and program
- (4 Marks)**
- d) Give three approaches that have proven successful when designing and implementing an operating system
(6 Marks)
- e) Briefly explain the five functions offered by the operating system.
(5 Marks)
- f) Write short notes on at least three benefits of threads **(3 Marks)**

Q2. a) Briefly explain the following terms as used in operating systems

- i. External Fragmentation
- ii. Internal Fragmentation
- iii. Memory protection
- iv. Swapping

(10 Marks)

b) With the aid of a well labelled diagram, describe and briefly explain the process states. **(5 Marks)**

c) What do we mean by deadlock **(2 Marks)**

d) Describe any three major advantages of Multiprocessor systems **(3 Marks)**

Q3. There are different scheduling algorithms. The following table shows the different processes arriving at different times.

Process	Burst time
P1	2
P2	3
P3	4
P4	8

i) Suppose the processes arrive in the order p_1, p_2, p_3, p_4 draw a GANTT chart for the schedule **(5 Marks)**

ii) Calculate the waiting time and hence the average waiting time for the processes **(5 Marks)**

iii) If the processes arrived in the order, p_4, p_2, p_3, p_1 ; draw a GANTT chart for the schedule **(5 Marks)**

iv) Calculate the waiting time and hence the average waiting time for the new order of processes **(5 Marks)**

Q4. a) Write short notes on the following terms as used in operating systems

- i) First in First out
- ii) Round Robin Scheduling
- iii) Shortest job First Scheduling
- iv) Priority scheduling

(10 Marks)

- b) Briefly explain Peterson's solution as a solution to the critical section problem. **(5 Marks)**
- c) Briefly explain atleast five types of systems calls **(5 Marks)**
- Q5. a) Write short notes on the following as used in operating system
- i) Response Time
 - ii) Turnaround Time
 - iii) Throughput
 - iv) Exception
 - v) Thread **(10 Marks)**
- b) What do u understand by the term Context Switching **(3 Marks)**
- c) Provide three reasons why a parent process may terminate a child process. **(3 Marks)**
- d) What do we mean by kernel in operating systems **(2 Marks)**
- e) What do we mean by deadlock **(2 Marks)**

END