MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2015/2016 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

COURSE CODE: HBT2102

COURSE TITLE: COMPUTER OPERATING SYSTEMS

DATE: 17th DECEMBER, 2015 **TIME:** 2 Hours

INSTRUCTIONS TO CANDIDATES

Answer Question ONE (1) and **any** other TWO Questions

MRUC observes ZERO tolerance to examination irregularities

QUESTION ONE (COMPULSORY)

ai) Describe the **five** major activities of an operating system in regard to process management.

[5 marks]

ii) Differentiate a process from a program by identifying the actual properties of a process. [6 marks

b) Use the table below to answer the questions that follow.

Process	Arrival time	Processing time
A	0.0	5
B	1.0	2
C	2.0	5
D	3.0	3

I) Draw a process execution timing chart of the system which is using the Shortest Remaining Time scheduling algorithm. [2 marks]

II) From the chart and the table above, Calculate;

i. The turnaround time for each process [4 marks]

ii. Average turnaround time 1 mark

iii. Wait time [4 marks]

iv. Average wait time [1 mark]

v. The throughput of the system. [2 marks]

iii) From the table above, draw the process execution timing charts of the system using the following scheduling algorithms.

i) Round Robin with quantum 1 and with quantum 2. [4 marks]

ii) First Come First Served.] 2 marks]

QUESTION TWO

ai) An operating system transforms the physical world of devices, instructions, memory, and time into virtual world through abstractions built by the operating system. Outline **four** main reasons for abstraction in operating systems. [4 marks]

ii) Explain the **six** discrete transition states of a process. [6 marks]

b) Describe the **four** objectives of a scheduling activity of a scheduling algorithm. [4 marks]

c) Justify the need of threads while designing an operating system. [6 marks]

QUESTION THREE

a) Stating characteristics and examples of each differentiate Preemptive from Non-preemptive Scheduling algorithms. [10 marks]

b) Compare and contrast a thread from a process with respect to an operating system.

[10 marks]

QUESTION FOUR

ai) Describe the **four** situations which would result to deadlock in computer operating systems.

[4 marks]

ii) Describe the approaches which can be used towards recovery after a deadlock has been detected in a computer operating system. [6 marks]

b) Many operating systems support a messaging system for sending messages between processes. Describe **ten** key guiding factors to follow while designing a messaging system. [10 marks]