(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE : CSC 224.

COURSE TITLE : PRINCIPLES OF OPERATING SYSTEMS

DATE: 25/07/2022 **TIME: 08:00 A.M – 10:00 A.M**

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE [COMPULSORY] [30 MARKS]

a Define the following terms:

i. Context switching [1 Mark]

ii. Scheduling [1 Mark]

iii. Time Sharing [1 Mark]

iv. Deadlock [1 Mark]

v. Critical section [1 Mark]

b By use of a well labeled diagram, describe the steps taken by a processor in executing an instruction. [5 Marks]

c Discuss "Facilities", "Cost" and "Adaptability" as desired qualities of Operating Systems. [6 Marks]

d Briefly describe the following scheduling algorithms:

i. First-Come-First-Served (FCFS) [2 Marks]

ii. Shortest Remaining Time (SRT) [2 Marks]

iii. Priority [2 Marks]

e Describe the four (4) conditions required for deadlock to occur. [8 Marks]

QUESTION TWO [20 MARKS]

a List and briefly discuss the two (2) internal registers of the processor clearly stating their main function. [4 Mark]

b Discuss the main goals of Operating Systems. [6 Marks]

c Draw a Resource Allocation Graph for the Circular Wait as a condition necessary for a

deadlock to occur. [6 Marks]

d State four (4) reasons that may cause a process to terminate. [4 Marks]

QUESTION THREE [20 MARKS]

a. Briefly discuss the functions of an operating system. [8 Marks]

b Briefly discuss any three (3) goals of scheduling. [6 Marks]

c Shortest-Job-First provides the minimal average turnaround time for jobs. Show why this is true. What is a disadvantage of this batch scheduling algorithm? [6 Marks]

QUESTION FOUR [20 MARKS]

a Using a well labeled diagram, describe the five-state process model including the suspend states. [10 Marks]

b Differentiate between the following terms:

i. Semaphores and monitors [2 Marks]

ii. Process and thread [2 Marks]

iii. Ready, Suspend and Blocked, Suspend [2 Marks]

iv. Preemptive and Non-preemptive scheduling [2 Marks]

v. Deadlock and Starvation [2 Marks]

QUESTION FIVE [20 MARKS]

a. Briefly discuss the four (4) control structures namely Memory tables, I/O tables, Files tables and Process tables used by the operating system to manage processes. [8 Marks]

b Identify the circumstances that may force the processor to switch execution of one process to another. [5 Marks]

c Define the following terms:

i. Kernel [1 Mark]

ii. Dispatcher [1 Mark]

iii. Program counter [1 Mark]

iv. Scheduler [1 Mark]

d Discuss the benefits of multiprogramming. [3 Marks]