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(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS**

**FOR THE DEGREE OF BACHELORS OF SCIENCE
(INFORMATION TECHNOLOGY)**

COURSE CODE: BIT 123

COURSE TITLE: PLATFORM TECHNOLOGIES I

DATE: 25/04/2023

TIME: 2.00 P.M.-4.00 P.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (COMPULSORY) [30 MARKS]

- a. Define the following terms as used in OS. [3 marks]
- i. Swapping
 - ii. Fetching
 - iii. Mutual exclusion
- b. Discuss the advantages of concurrent processing [3 marks]
- c. What are the five major activities of an operating system in regard to process management? [5 marks]
- d. State and explain any three CPU scheduling algorithms [9 marks]
- e. Draw a process state diagram with 5 states naming all the possible states and illustrate the legal transitions between these states. Describe all the reasons why a process may transition in or out of the ready state. [10 marks]

QUESTION TWO [20 MARKS]

- a. Briefly explain the difference between, long-term, medium-term and short-term scheduling. [3 marks]
- b. Explain the terms pre-emptive scheduling and non-pre-emptive scheduling. [2 marks]
- c. What are the five major activities of an operating system in regard to process management? [5 marks]
- d. Identify and discuss the two types of fragmentation clearly showing how each can be avoided. [10 marks]

QUESTION THREE [20 MARKS]

- a. Explain advantages and disadvantages Demand Paging [4 marks]
- b. Discuss the conditions for Deadlock [8 marks]
- c. Describe four strategies to overcome deadlock ones it is Detected. [8 marks]

QUESTION FOUR [20 MARKS]

- a. Differentiate between a process and a program [2 marks]
- b. With regard to process synchronization describe what is meant by race conditions? [4 marks]
- c. Explain various function of operating system. [4 marks]
- d. What are the differences between pager and swapper in memory management? [4 marks]
- e. Outline each element stored in the process control block (PCB). [6 marks]

QUESTION FIVE [20 MARKS]

- a. Memory management component is one of the operating systems components. Describe four responsibilities of this component [4 marks]

- b. Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P1	10	3
P2	4	1
P3	3	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

Required:

- i. Draw four Gantt charts illustrate the execution of the processes using FCFS, SJF, a non-preemptive priority (a smaller number implies a higher priority), and Round Robin (time slice = 1) scheduling. **[8 marks]**
- ii. What is the average turnaround time for each scheduling algorithm? **[4 marks]**
- iii. What is the average waiting time for each scheduling algorithm? **[2 mark]**