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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2021/2022 ACADEMIC YEAR
END OF SEMESTER EXAMINATIONS
FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

DIT 1004: OPERATING SYSTEMS

Date: APRIL, 2022
Time: 2 Hours.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE: COMPULSORY (30 MARKS)

- Highlight the services operating systems provide to programs and to the users of those programs in order to make the programming task easier. (4 marks)
- Briefly explain the process states that changes as a process is being executed. (6 marks)
- Identify and explain the different approaches to implement inter-process communication in a system. (6 Marks)
- Explain the inconveniences that a user can face while interacting with a computer system, which is without an operating system? (6 marks)
- Consider the following set of processes, with the length of the CPU-burst time given in milliseconds. Suppose that the processes' arrival time and burst time are as shown in the table below.

| Process | Arrival Time | Burst Time |
|----------------|--------------|------------|
| P ₁ | 0 | 10 |
| P ₂ | 8 | 15 |
| P ₃ | 8 | 12 |
| P ₄ | 10 | 15 |

Use the Round Robin Algorithm on a quantum of 5 to;

- Calculate the Waiting Time in each process (2 marks)
- Calculate the Total Around Time in each process (2 marks)
- Draw the Gantt chart representing these processes. (4 marks)

QUESTION TWO: (20 MARKS)

- a) Explain clearly main tasks that are performed by a kernel in operating system. (4 marks)
- b) Explain the characteristics of First Come First Served scheduling algorithm. (8 marks)
- c) The operating system is responsible for different activities in regard to file system management. Discuss. (8 marks)

QUESTION THREE: (20 MARKS)

- a) The OS performs the task of scheduling processes based on priorities using different algorithms. Discuss any four of these algorithms of process scheduling. (10 marks)
- b) The classes of modern operating system may be classified by the nature of interaction that takes place between the computer and the user. State and explain the five classes of operating system you know. (10 marks)

QUESTION FOUR: (20 MARKS)

- a) Describe round robin scheduling. What are the parameters associated with the scheduler. (4 marks)
- b) Discuss the two models of inter-process communication. (6 marks)
- c) Explain what the benefits of a multiprocessor system are. (10 marks)

QUESTION FIVE: (20 MARKS)

- a) Discuss the five types of Kernel in Operating System. (10 marks)
- b) Explain four conditions that may cause a deadlock to arise during processes execution. (10 marks)