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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
DIT 1004 – OPERATING SYSTEMS

Date: 10TH AUGUST 2023
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) 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	18
P ₂	8	6
P ₃	8	12
P ₄	10	8

Use the Round Robin Algorithm on a quantum of 3 to;

- i) Calculate the Waiting Time for each process (2 Marks)
 - ii) Calculate the Total Around Time for each process (2 Marks)
 - iii) Draw the Gantt chart representing these processes. (4 Marks)
- b) Highlight four types of the operating system kernels. (2 Marks)
- c) Differentiate between a multiprogramming system and a multitasking system. (4 Marks)
- d) Explain the services operating systems provide to programs and to the users of those programs in order to make the programming task easier. (4 Marks)
- e) Use a diagram to describe the process states that change as a process is being executed in a computer system. (6 Marks)
- f) Identify and explain the different approaches to implement inter-process communication in a system. (6 Marks)

QUESTION TWO (20 MARKS)

- a) Identify any two types of user operating system interfaces and explain their differences. (4 Marks)
- b) The OS performs the task of scheduling processes based on priorities using different algorithms. Discuss any four of these algorithms of process scheduling. (8 Marks)
- c) 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 four classes of operating system you know. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Explain the objectives of an operating system. (4 Marks)
- b) Use a well-drawn diagram to describe the basic structure view of an operating system services. (8 Marks)
- c) Describe the booting up process of a window 7 operating system. (8 Marks)

QUESTION FOUR (20 MARKS)

- a) Explain clearly main tasks that are performed by a kernel in operating system. (4 Marks)
- b) Describe 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 FIVE (20 MARKS)

- a) Explain four conditions that may cause a deadlock to arise during processes execution. (4 Marks)
- b) Explain what the benefits of a multiprocessor system. (8 Marks)
- c) Use diagrams to describe the two models of inter-process communication. (8 Marks)