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**KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2020/2021 ACADEMIC YEAR
FOR THE CERTIFICATE IN INFORMATION TECHNOLOGY**

CIT 1004: OPERATING SYSTEMS

Date: DECEMBER 2020
Time: 2 Hrs.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Differentiate between the following terminologies? (4Marks)
- A process and a program
 - A kernel and a processor mode
- b) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds. Suppose that the processes arrive in the order: P_1, P_2, P_3 .
- | <u>Process</u> | <u>Burst Time</u> |
|----------------|-------------------|
| P_1 | 18 |
| P_2 | 4 |
| P_3 | 2 |
- Draw the Gantt chart representing these processes. (5 Marks)
 - Calculate the Average Waiting Time (AWT). (5 Marks)
- c) Explain different services an operating system performs in any computer system. (6 Marks)
- d) The operating system is responsible for different activities in regard to file system management. Explain any five of those activities. (10Marks)

QUESTION TWO (20 MARKS)

- Explain four objectives of operating system. (4 Marks)
- Discuss the two models of inter-process communication. (6 Marks)
- Discuss five roles of operating system when comes to device management in a computer system. (10 Marks)

QUESTION THREE (20 MARKS)

- a) What is a deadlock? Explain four conditions that may cause a deadlock to arise during processes execution. (10 Marks)
- b) Clearly name and explain the five types of Kernel in Operating System. (10 Marks)

QUESTION FOUR (20 MARKS)

- a) 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)
- b) A threat is a program that is malicious in nature and leads to harmful effects for the system. Discuss some of these security threats in operating system and explain their protections respectfully. (10 Marks)

QUESTION FIVE (20 MARKS)

- a) Explain the key differences between Preemptive and Non-Preemptive Scheduling strategies. (6 Marks)
- b) Explain clearly main tasks that are performed by a kernel in operating system. (6 Marks)
- c) The OS performs the task of scheduling processes based on priorities using different algorithms. Explain any four of these algorithms of process scheduling. (8 Marks)