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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS, 2022/2023 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS

FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

DIT 1004: OPERATING SYSTEMS

Date:
Time:.

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTIONS ONE (30 MARKS)

a) Explain the five main purposes as to why operating systems must exist in computer systems. (5 marks)

b) The operating system is responsible for different activities in regard to storage management. Explain any five of these activities. (5 marks)

c) Highlight the five classes of modern operating system. (5 marks)

d) State and explain the different states of a process during execution. (5 marks)

e) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds. Suppose that each process arrived at the CPU at its own time and used different CPU burst time as shown in the table below:

Processes	Arrival Time	Burst Time
P_1	0	10
P_2	3	18
P_3	7	12
P_4	10	8

Use the Round Robin Algorithm in a Quantum of 4 in milliseconds to;

(i) Draw the Gantt chart representing these processes. (4 marks)

(ii) Calculate the Waiting Time for each process. (3 marks)

(iii) Calculate the Total Around Time for each process. (3 marks)

QUESTION TWO: (20 MARKS)

a) Elaborate the relevance of multiprogramming systems. (6 marks)
b) Briefly explain how a round robin scheduling algorithm works in computer systems. (6 marks)
c) Clearly discuss the two primary models of inter-process communication (8 marks)

QUESTION THREE: (20 MARKS)

a) Explain four objectives of operating system. (4 marks)
b) System calls provide a means for user or application programs to call upon the services of the operating system. Explain at least four major types of system calls. (8 marks)
c) Explain different steps on how booting up of the computer system takes place from the process of switching on till the computer gets ready for use in windows operating systems. (8 marks)

QUESTION FOUR: (20 MARKS)

a) Highlight four types of operating system kernels. (4 marks)
b) Discuss the four conditions that may cause a deadlock to arise during processes execution in a digital computer. (8 marks)
c) 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. (8 marks)

QUESTION FIVE: (20 MARKS)

a) Make short notes on the following user interface: (4 marks)
    i) Graphical user interface
    ii) Command line interpreter
b) Describe any four methods for inter-process communication. (8 marks)
c) The operating system performs the task of scheduling processes based on priorities using different algorithms. Explain any four of these algorithms of process scheduling. (8 marks)