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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
DIT 1004- OPERATING SYSTEMS

Date: 08TH DECEMBER 2022
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Define the following operating systems terms?
- i) Multiprogramming (2 Marks)
 - ii) Multiprocessing (2 Marks)
 - iii) Multitasking (2 Marks)
 - iv) Multithreading (2 Marks)
- b) 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	8
P ₂	2	8
P ₃	3	12
P ₄	8	10

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)
- c) Explain four different roles that operating systems play in any computer system. (4 Marks)
- d) Highlight six classes of modern operating system. (4 Marks)
- e) The operating system is responsible for different activities in connection to device management. Explain any six of those activities. (6 Marks)

QUESTION TWO: (20 MARKS)

- a) Explain the difference between graphical user interface and command line interpreter that are being used by different commercial operating systems. (4 Marks)
- b) The modern operating systems perform the task of scheduling processes based on priorities using different algorithms. Explain any four types of process scheduling algorithms. (8 Marks)
- c) Use a well labeled diagram to describe the structure view of an operating system services. (8 Marks)

QUESTION THREE: (20 MARKS)

- a) Describe the relevance of batch processing systems. (4 Marks)
- b) Explain any four malicious programs that can harm any computer system and its data when comes to security, and outline their protections respectfully. (8 Marks)
- c) State and discuss any four methods of inter-process communication. (8 Marks)

QUESTION FOUR: (20 MARKS)

- a) Explain clearly four main tasks that are performed by a kernel in 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 four conditions that may cause a deadlock to arise during processes execution. (8 Marks)

QUESTION FIVE: (20 MARKS)

- a) Explain the two main purposes as to why operating systems must exist in any functional computer system. (4 Marks)
- b) Use diagrams to differentiate between the two models of inter-process communication. (8 Marks)
- c) Describe the booting up process of a window 7 operating system. (8 Marks)