Kasarani Campus
Off Thika Road
Tel. 2042692 / 3
P. O. Box 49274, 00100
NAIROBI
Westlands Campus
Pamstech House
Woodvale Grove
Tel. 4442212
Fax: 4444175

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: 13TH APRIL 2022
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

a) Briefly explain the differences between the following operating system concepts.
   i) Microkernel and monolithic kernel. (2 Marks)
   ii) Real-time systems and Time-sharing systems (2 Marks)

b) 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	15
P_2	1	12
P_3	4	9
P_4	6	11

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) List four components that operating system manages efficiently. (2 Marks)

d) Discuss the inconveniences that a user can face while interacting with a computer system which is without operating system (4 Marks)

e) Explain the differences between user's view and system's view in operating system. (6 Marks)

f) 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. (6 Marks)

QUESTION TWO (20 MARKS)

a) Explicate different activities that operating systems play in connection with file systems management. (6 Marks)

b) Describe the general strategy behind deadlock prevention, and give an example of a practical deadlock prevention method in operating system. (6 Marks)

c) Mention and describe the key differences between the two CPU scheduling strategies. (8 Marks)

QUESTION THREE (20 MARKS)

a) Explain the roles played by the operating system when comes to storage management (6 Marks)

b) Elucidate clearly main tasks that are performed by a kernel in operating system. (6 Marks)

c) System calls provide a means for user or application programs to call upon the services of the operating system. Identify and explain any four types of system call that you know. (8 Marks)

QUESTION FOUR (20 MARKS)

a) Explicate three main objectives of the operating systems in regard to computers. (6 Marks)

b) Briefly describe different managerial roles of operating systems in microcomputers. (6 Marks)

c) Discuss some security threats that are malicious in nature which can lead to harmful effects of the operating system and explain their protections respectfully. (8 Marks)

QUESTION FIVE (20 MARKS)

a) Discuss the two models of inter-process communication. (6 Marks)

b) Elucidate the relevance of batch operating system in computer systems. (6 Marks)

c) Describe different strategies that can be used to remove a deadlock after its occurrence during resources processes. (8 Marks)