JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN INFORMATION COMMUNICATION TECHNOLOGY

3rd YEAR 1st SEMESTER 2022/2023 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ICB 1303

COURSE TITLE: Advanced Operating System

EXAM VENUE: STREAM: BSc Information Communication Technology

DATE: DECEMBER 2022 EXAM

SESSION: TIME: 2.00 HOURS

INSTRUCTIONS:

1. **Answer Question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

Question 1

a) Explain **the main** rationale of learning about advanced operating System (2mks)
b) State and explain the **TWO basic** functions of an operating system (4mks)
c) Distinguish between Policies and Mechanisms in the design of Operating System (2mks)
d) Identify and explain **THREE** Design approaches in Operating System (6mks)
e) A process is a program whose execution has started but is not yet complete (i.e., a program in execution). State the **THREE** basic states of a process. (3mks)
f) Define a semaphore as used in synchronization and write an expression to unblock a process (2mks)
g) Describe **FOUR** activities of operating system does in memory management (4mks)
h) Define spooling as used in peripheral operations and state **TWO** advantages of spooling (3mks)
i) State **TWO** demerits of Paging (1mk)
j) Identify and explain **THREE** system threats. (3mks)

Question 2

a) Define a thread and explain the **TWO** types of threads (5mks)
b) Identify and explain **FOUR** Benefits of multithreaded programming (8mks)
c) Define Virtual memory and identify **SIX** situations where an entire program is not required to be fully loaded in main memory (7mks)

Question 3

(a) Discuss **FOUR** common program threats which compromises the security of a computer (4mks)
(b) Identify **THREE** components of a Linux operating System (6mks)
(c) State and explain **FIVE** basic features of a Linux Operating system (10mks)

Question 4

(a) State and explain the **FIVE** process scheduling Algorithms (10mks)
(b) A Process Control Block (PCB) is a data structure maintained by Operating System for every process. List down **TEN** information a PCB needs to keep track of a process(10mks)

Question 5

(a) Operating systems can be categorized as; architecture and application driven, Identify and explain the **FOUR** types of advanced operating systems under the two categories (8mks)
(b) With the aid of a well-drawn **diagram** describe the **FIVE** process life cycle of an Operating system. (12mks)