



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY

DEPARTMENT OF DIGITAL TECHNOLOGY

EXAMINATION PAPER

COURSE CODE : CDT 104
COURSE TITLE : Operating Systems
SPECIAL REQUIREMENTS : None
DURATION : 3 Hours
LEVEL : 1.2
DATE : November 2019

14 NOV 2019

INSTRUCTIONS TO CANDIDATES:

1. The examination consists of five questions answer any **four** questions of your choice
2. Each question carries 25 marks
3. The marks allocation for each question is indicated in **BOLD** font.

Question 1

- a) How does dual mode operation help to secure an operating system? [5 marks]
- b) Explain the difference between a process and a thread. [10 marks]
- c) Explain the difference between polling and an interrupt. [10 marks]

Question 2

- i) Describe the seven-state process model with the aid of a diagram. [14 marks]
- ii) Describe the sequence of events that occurs during system start-up/ On Power up. (Booting process of a computer) [11 marks]

Question 3

The table below shows the arrival time of processes.

Process ID	Arrival time	Service Time	Finish Time	Turnaround	Normalized turnaround
P1	0	3			
P2	2	6			
P3	4	4			
P4	6	5			
P5	8	2			

- a) Complete the above table using the following scheduling policies.
 - i) First-in-First-out (FIFO). [5 marks]
 - ii) Shortest Job First (SJF). [5 marks]
- b) Draw a Gantt chart for each scheduling policy.
 - i) First-in-First-out (FIFO). [5 marks]
 - ii) Shortest Job First (SJF). [5 marks]
- c) Based on your results from part (a) and (b) which is the best scheduling policy? [5 marks]

Question 4

- i) Explain 2 types of threads [6 marks]

- ii) Explain the following terms; **[4 marks]**
- a. Registers
 - b. Caches
 - c. Main memory
 - d. Program Counter
- iii) Explain the problems faced when sharing a resource such as a circular buffer using the producer and the consumer as examples. Recommend solutions to mitigate the issues. **[15 marks]**

Question 5

- i) Differentiate between the 2 types of interrupts **[8 marks]**
- ii) Explain any six (6) examples of Operating Systems and their application. **[12 marks]**
- iv) Explain how buffering can improve the performance of a computer system. **[5 marks]**

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