

OPERATING SYSTEM (CSS 223): TEST 2 (SEMESTER 2 2019/2020)
BSc. ITS, MICT-EDU, ICTM & ICTB-II

Time 40 minutes

Answer ALL questions in brief.

- 1 5. Write TRUE for the correct statement and FALSE for incorrect statement.
- a e) Providing information in advance about what resources will be needed by processes do not guarantee that deadlock will not exist..... (1/2 Marks)
 - b f) Deadlock is a problem that can exist when a group of processes compete for access to variable resources..... (1/2 Marks)
 - c g) Hold and wait means there must be a process holding one resource, releasing and waiting for another resource..... (1/2 Marks)
 - d h) A logical and physical address is the memory location generated by the CPU..... (1/2 Marks)
- 2 6. Define the following term as used in memory management in OS: Swapping, segmentation and paging (3 Marks)
- 3 7. Why polling is synchronous while interrupt is asynchronous process in OS?(5 Marks)
- 4 8. Write down a simple programme of I/O with Interrupts with reference to Keyboard as an example (5 Marks)

Prepared by Dr. Kisanjara

OPERATING SYSTEM (CSS 223)

TEST 1 (SEMESTER 2 2019/2020)

BSc. ITS, MICT-EDU, ICTM & ICTB-II

Time 45 minutes

Answer ALL questions in brief. Your answers in each question do not exceed normal 10 lines. Stick to the point.

1. Based on the context of operating system, how can user program disturb the normal operation of the system? (3 marks)
 2. Based on the process co-operating context, what is the use of process communication? (3 marks)
 3. Based on the context of two modes of operating systems, compare user threads and kernel threads. (3 marks)
 4. Why system call is important in the context of process and operating system? (3 marks)
 5. Why race condition is not recommended in multiple process execution? (3 marks)
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OPERATING SYSTEM (CSS 223)

TEST 1 (SEMESTER 2 2019/2020)

BS, ITS, MICT-EDU, ICTM & ICTB-II

Time 45 minutes

Answer ALL questions in brief. Your answers in each question do not exceed normal 10 lines. Stick to the point.

1. Based on the context of operating system, how can user program disturb the normal operation of the system? (3 marks)
2. Based on the process cooperating context, what is the use of process communication? (3 marks)
3. Based on the context of two modes of operating systems, compare user threads and kernel threads (3 marks)
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5. Why race condition is not recommended in multiple process execution? (3 marks)



**MZUMBE UNIVERSITY
(CHUO KIKUU MZUMBE)**

Faculty of Science and Technology

End of Semester II Examinations: August, 2020

Course Code:	CSS 223
Course Title:	Operating System
Programme:	Bsc. ITS-II, ICTB-II, ICTM & MICT EDU-II
Date:	8/18/2020
Time:	12:00 – 15:00 HRS
Venue:	LUTHULI CR1 & LUTHULI CR2

Instructions:

- 1. There are Four (4) Questions in this paper**
- 2. Answer All Questions in this paper**
- 3. Each question carries 25 Marks**

The Registrar

QUESTION ONE:**(25 MARKS)**

a) Write **TRUE** for the correct statements and **FALSE** for incorrect statements that follows:

- i. Providing information in advance about what resources will be needed by processes do guarantee that deadlock will not exist. **(1 Mark)**
- ii. Deadlock is a problem that can exist when a group of processes compete for access to fixed resources. **(1 Mark)**
- iii. Hold and wait means there must be a process holding one resource and waiting for another resource. **(1 Mark)**
- iv. A logical or virtual address is the memory location generated by the CPU. **(1 Mark)**

b) Define the following term as used in memory management in OS: Swapping, segmentation and paging **(6 Marks)**

c) Why polling is synchronous while interrupt is asynchronous process in operating system? **(5 Marks)**

d) Write down a simple interrupt program based on I/O with reference to Keyboard as an example **(10Marks)**

QUESTION TWO:**(25 MARKS)**

a) What is CPU scheduling?

(5Marks)

b) Briefly discuss the four (4) scheduling algorithms by citing problems of each algorithm. **(10 Marks)**

- c) Provide differences between pre-emptive and non pre-emptive scheduling (10 Marks)

QUESTION THREE:

(25 MARKS)

- a) Define the term *interrupt* and *polling* as used in operating system (4 Marks)
- b) Write down simple programmed I/O codes to compare the interrupt and polling (10 Marks)
- c) Consider a simple program below illustrating transaction as example of ATM machine.

```
curr_balance=get_balance(acct_ID)
you: withdraw_amt=read_amount()
you: curr_balance=curr_balance-withdraw_amt
so: curr_balance=get_balance(acct_ID) ← context switch
so: withdraw_amt=read_amount()
so: curr_balance=curr_balance-withdraw_amt
so: put_balance(acct_ID,curr_balance)
so:deliver_bucks(withdraw_amt) ← context switch
you: put_balance(acct_ID,curr_balance)
you: deliver_bucks(withdraw_amt)
```

Briefly explain what and why happens to the transaction process above? (11 Marks)

QUESTION FOUR:

(25 MARKS)

- a) Define the terms counting semaphore and binary semaphore in operating system (4 Marks)
- b) Briefly discuss how deadlock can be prevented (8 Marks)

c) Write a program that shows step by step the implementation of semaphore, involving its usage and declaration **(13 Marks)**