TEVETA

ADVANCED CERTIFICATE IN COMPUTER STUDIES

TQF 5 EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATION

SITTING: AUGUST 2017

SUBJECT: OPERATING SYSTEMS

TIME: 3 HOURS

TOTAL MARKS: 100

PASS MARK: 50

INSTRUCTIONS

1. Write your examination number and national registration card number on the answer booklet.
2. There are seven (7) questions in this booklet.
3. You are required to attempt any five (5) questions.
4. All questions carry equal marks.
5. Cell phones and programmable calculators are not allowed in the examination room.
6. No candidate is allowed to leave the examination room one (1) hour after the start of the examination and thirty (30) minutes before the end of the examination.

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Question One

a) What is a unit of resource ownership? (2 marks)
b) Describe the kinds of programs that can be multithreaded. (6 marks)
c) Explain in detail how processes communicate? (6 marks)
d) Giving examples, discuss how processes share data? (6 marks)

[Total 20 marks]

Question Two

a) List five (5) services provided by an operating system and explain how each provides convenience to the users. (4 marks)
b) Write short notes on the following;
i) Concept of a Process (4 marks)
ii) Memory Management (4 marks)
iii) FCFS (4 marks)
iv) Pre-emptive and non pre-emptive resources (4 marks)

[Total 20 marks]

Section B

Answer three (3) questions

Question Three

a) Define a critical section. (4 marks)
b) What is mutual exclusion? (4 marks)
c) Distinguish between long term and short term schedulers. (8 marks)
d) What are the characteristic properties of the code that form a critical section? (4 marks)

[Total 20 marks]

Question Four

a) Define a semaphore. (4 marks)
b) Distinguish between compile time and load time. (6 marks)
c) Discuss swapping. (4 marks)
d) With the help of a well labeled diagram, briefly discuss storage structures. (6 marks)

[Total 20 marks]

Question Five

a) What are nachos? (4 marks)
b) Describe the kinds of programs that can be multithreaded. (6 marks)
c) Distinguish between a process and a thread. (4 marks)
d) Critically assess PCB. (6 marks)

[Total 20 marks]

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Question Six

Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the question, use non preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

Remember that turnaround time is finishing time minus arrival time, so you have to subtract the arrival times to compute the turnaround times.

a) What is a process? (3 marks)

b) What is the average turnaround time and penalty ratio for these processes with the FCFS scheduling? (10 marks)

c) List the deadlock conditions and briefly explain solutions to deadlocks. (7 marks)

[Total 20 marks]

Question Seven

a) What is an operating system? (2 marks)

b) Distinguish between multiprogramming and multiprocessing. (6 marks)

c) Write short notes on the concept of a process. (6 marks)

d) Discuss the three more recent developments with regard operating systems. (6 marks)

[Total 20 marks]

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