



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN MATHEMATICS & COMPUTER SCIENCE
(BSMC 12J)

EIT 4252: OPERATING SYSTEMS

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2013
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

- a) Providing an example of each, differentiate between the following operating systems:
- (i) Multi-user **(3 marks)**
 - (ii) Multiprocessing **(3 marks)**
 - (iii) Multitasking **(3 marks)**
 - (iv) Multithreading **(3 marks)**
- b) Explain what you understand by the terms Kernel **(2 marks)**
- c) Explain why the layered approach is important when designing operating systems **(4 marks)**
- d) Illustrate the THREE state process model, clearly indicating the states and state transitions involved. **(6 marks)**
- e) Explain the concept of CPU scheduling **(3 marks)**
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f) Explain whether it is possible to have a deadlock involving only ONE process (3 marks)

Question Two

a) Explain the working set model of a process (3 marks)

b) Define and explain the function of a context switch (4 marks)

c) Define the term thread (4 marks)

d) Outline TWO differences between user-level-threads and kernel level threads (6 marks)

e) Describe the actions taken by the Kernel during the context switching between process. (3 marks)

Question Three

a) Describe the RAID concept in disk management (8 marks)

b) Consider a disk with the following properties:

- Number of surface = 16
- Number of sectors/cylinder = 4096
- Number of tracks/surface = 2048
- Number of bytes/sector = 512

Showing your calculations, determine:

- (i) The number of platters the disk has (4 marks)
- (ii) The total size of the disk (4 marks)
- (iii) The number of sectors per track (4 marks)

Question Four

a) Describe the following allocation algorithms:

- (i) Best fit (3 marks)
- (ii) Worst fit (3 marks)
- (iii) First fit (3 marks)

b) Giving reasons, explain which one you think is the most efficient algorithm (5 marks)

c) Provide THREE circumstances in which a process can be terminated (6 marks)

Question Five

a) Discuss the differences between preemptive and non preemptive scheduling (6 marks)

b) Explain the advantages of having different time-quantum sizes of different levels of a multilevel queuing system (6 marks)

c) Explain why it would be inadvisable for strict non preemptive scheduling to be used in your computer lab (8 marks)