TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BTIT 13S)

EIT 4109: OPERATING SYSTEMS

END OF SEMESTER EXAMINATION
SERIES: APRIL 2014
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 (COMPULSORY)** 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) Outline THREE performance criteria used to select a scheduling algorithm. **(6 marks)**

b) The operating system uses the shortest job-first scheduling technique for its job allocation. Explain its:
- **(i)** Advantage
- **(ii)** Limitation, suggesting a solution **(6 marks)**

c) With the aid of a diagram, describe the process states. **(5 marks)**

d) (i) Define memory fragmentation.
(ii) Suppose a 22k user space broken into 10k region and THREE 4k regions. Describe how memory fragmentation can be used. If queue contains 7k, 3k, 6k, and 6k. **(3 marks)**

e) Describe the following as used in the CPU.
- **(i)** Buffer
- **(ii)** Spool

(iii) Cache memory

f) Explain the concept of Direct Memory Access (DMA) with respect to I/0 device management. **(4 marks)**

Question Two

a) Explain interrupts and how there being handled by the operating system. **(4 marks)**

b) Describe the contents of a Process Central Block (PCB) **(6 marks)**

c) What is swapping? Does swapping increase the operating systems overheads? Justify your answer. **(6 marks)**

d) With the aid of a simplified queuing diagram distinguish between ready and device queue. **(4 marks)**

Question Three

a) Distinguish between block and character devices giving example of each. **(4 marks)**

b) Explain TWO factors that affect the time taken to read or write a disk block. **(6 marks)**

c) With the aid of a diagram, describe the paging process. **(6 marks)**

d) Describe the operation of the following:
- **(i)** Asymmetric Multiprocessing (AMP)
- **(ii)** Time sharing **(4 marks)**

Question Four

a) The following jobs arrive according to the time shown below:

JOB	AT	CPU Burst
A	0	20
B	2	15
C	4	2
D	6	6

Construct a Gantt chart for FCFS and work out the Average Waiting Time (AWT) and Average Turn Around Time (ATT) **(10 marks)**

b) Explain the following operating system functions:
- (i) Logging and Accounting
- (ii) Error Reporting **(3 marks)**

c) Operating system is responsible for several activities in connection with file management. Explain these activities. **(7 marks)**

Question Five

a) Given memory partitions of 1 week, 5 weeks, 2 weeks, 3 weeks and 6 weeks how would each of the first-fit, best-ft worst fit algorithm place processes of 212k, 417k, 112k and 426k in order? Which algorithms make the rest efficient use of memory? **(6 marks)**

b) Explain FOUR necessary conditions of deadlock prevention. **(8 marks)**

c) Explain inter process communication and two fundamental models of inter process communication. **(6 marks)**