Technical University of Mombasa

Institute of Computer Science and Informatics

DEPARTMENT OF COMPUTER SCIENCE

ICS2202 /EIT4109   OPERATING SYSTEM

Special/Supplementary exam

End of Semester Exam

May 2016 Series

Time: 2 Hours

<u>Instructions to Candidates</u>

- Question ONE is Compulsory

- Answer Any TWO Question in Section B

- Switch OFF mobile phones.

Question One (30 Marks)

Question 1

a)   Explain the following terms:-

      i.   CPU utilization.
     ii.   Throughput.
    iii.   Response time.   **(6 Marks)**

b) State **three** activities in which Operating System is responsible in connection with memory management.   **(3 Marks)**

c) State any **five** content maintained by the process control block.

                                                     (5 Marks)

d)   Differentiate between the following
    a. Device drivers and device controllers.
    b. Pre-emptive and non-preemptive   **(6 Marks)**

e) The following jobs arrive according to the time shown below.

Job	AT	CPU Burst
A	0	30
B	2	25
C	4	12
D	6	16

f) Construct a Gantt chart for FCFS and work out the Average waiting Time (AWT) and Average Turn Around Time (ATAT).   **(10 Marks)**

Question Two (20 Marks)

a) The development of operating systems can be seen to be closely associated with the development of computer hardware. Describe the main developments of operating systems that occurred at each computer generation. **(8 Marks)**

b) With the help of a diagram, give a detailed explanation of the process cycle. Explain the reasons a process will have to move from one state to the other.
(12 Marks)

Question Three (20 Marks)

a. Differentiate between preemptive and non-preemptive scheduling. (4 Marks)
b. Given the following

Process	Burst Time
P_1	53
P_2	17
P_3	68
P_4	24

Calculate the average wait time using the Round robin and FIFO scheduling algorithms Assume that a quantum of 20 is being used. (10 Marks)
c. Explain three memory loading approaches. (6 Marks)

Question Four (20 Marks)

a. Explain Four Conditions for Deadlock (8 Marks)
b. Describe two file system implementations that use linked lists. Describe the advantages and disadvantages of each method. (12 Marks)

Question Five (20 Marks)

a. Explain the Banker's algorithm for deadlock avoidance. (5 Marks)

b. Explain various file attributes and file operations in brief. (5 Marks)

d. Explain swapping in memory management. (5 Marks)

e. Explain the Least Recently Used (LRU) Algorithm (5 Marks)