KENYA METHODIST UNIVERSITY

END OF 1ST TRIMESTER 2010 EXAMINATIONS

FACULTY   :   COMPUTING AND INFORMATICS
DEPARTMENT   :   COMPUTER INFORMATION SYSTEMS
UNIT CODE   :   CISY 201
UNIT TITLE   :   OPERATING SYSTEMS CONCEPTS
TIME   :   2 HOURS

Instructions:
- *Answer question 1 and any other 2 questions.*

Question 1 (30 marks)

a)   Define operating systems.   (2 mks)

b)   State and briefly describe the two main functions of an operating system.   (4 mks)

c)   Distinguish between;
      i)   Deadlock avoidance and deadlock prevention
      ii)   Response time and turnaround time
      iii)   Process and program   (6 mks)

d)   Briefly describe the function of a device driver.   (2 mks)

e)   State any two responsibilities of the operating system with regard to file management.
        (2 mks)

f)   What is interprocess communication (IPC)?   (2 mks)

g)   Briefly describe the function of the following operating systems components;
      i)   Protection system
      ii)   Command interpreter   (4 mks)

h)   State two I/O software design issues.   (2 mks)

i)   Define:
      i)   File
      ii)   Device controller
      iii)   Deadlock   (6 mks)

Question 2 (20 marks)

a)   Briefly describe the following operating system design structures;
      i)   Layered
      ii)   Client server   (4 mks)

b)   With the help of appropriate examples, describe the two types of computer resources.
        (6 mks)

c)   What is a thread?   (2 mks)

d)   Briefly describe the following considerations in determining a good CPU scheduling algorithm.
   i)   Throughput
   ii) Fairness   (4 mks)
e)   State and briefly explain the two options, for breaking deadlocks, during deadlock recovery.
   (4 mks)

Question 3 (20 marks)
a)   What is memory compaction?   (2 mks)
b)   Briefly describe the best-fit algorithm used in memory management with linked tests.
   (4 mks)
c)   What is priority scheduling, and how does it lead to starvation and long wait?   (4 mks)
d)   State the four circumstances under which CPU scheduling divisions may take place.
   (4 mks)
e)   State and briefly describe three methods of achieving mutual exclusion by busy waiting.
   (6 mks)

Question 4 (20 marks)
a)   Briefly describe the seek operation as used in file management.   (2 mks)
b)   i)   Describe the relocation and protection problems in memory management.
   ii) How are base and limit registers used to solve the problems?   (8 mks)
c)   With the help of a diagram, describe the three main process states and transitions between them.   (10 mks)