KABARAK   UNIVERSITY

SUPPLEMENTARY/SPECIAL EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: **COMP 220**

COURSE TITLE: **OPERATING SYSTEMS**

STREAM: **SESSION II**

DAY: **THURSDAY**

TIME: **9.00 - 11.00 P.M.**

DATE: **19/03/2009**

INSTRUCTIONS:

1. This question paper has FIVE questions
2. Answer question ONE and any other TWO questions

PLEASE TURN OVER

QUESTION ONE (30 MARKS) COMPULSORY

(a) Explain the meaning of the following
   i.   Convoy Effect
   ii.   Computer resources   (4mks)

(b) Distinguish between the following
   i.   Input output (I/O) and processor bound processes
   ii.   Paging and swapping   (4mks)

(c) Explain five factors to consider when choosing an operating system   (5mks)

(d) Explain what each of the following batch file lines does when executed

```
@echo off
REM Usage: batchfilename
:start
Echo Hello
Goto :start
REM end of program
```
                                                                         (6mks)

(e) Suppose processes P1, P2 and P3 arrive for processing that order, and given that

| *Process*	*Burst*
P1	11
P2	4
P3	5

   i.   Determine the average waiting time   (5mks)

   ii.   Given that the processes above arrived for processing in the order P2, P3 and
           P1, determine the new average waiting time. Name and explain this effect
                                                                         (6mks)

QUESTION TWO (20 MARKS) ELECTIVE

(a) What is file system?   (2mks)

(b) Describe the following file systems
   i.   FAT16
   ii.   FAT32
   iii.   NTFS   (6mks)

(c) Describe defragmentation and state the precaution taken before performing
    defragmentation   (3mks)
(d) Explain the terms clusters, tracks and sectors as used in disk storage devices
                                                                         (4mks)
(e) Explain any **five** utility programs   (5mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) Distinguish between
   - i.   swapping and paging
   - ii.   upper and lower memory   (4mks)

(b) List **four** types of page swapping algorithms   (2mks)

(c) With the aid of an illustration, describe a page table   (4mks)

(d) The figure below shows used and free (white) memory blocks at a given allocation time:

Last placement

OS														

8   12   22   18   6   8   14   36
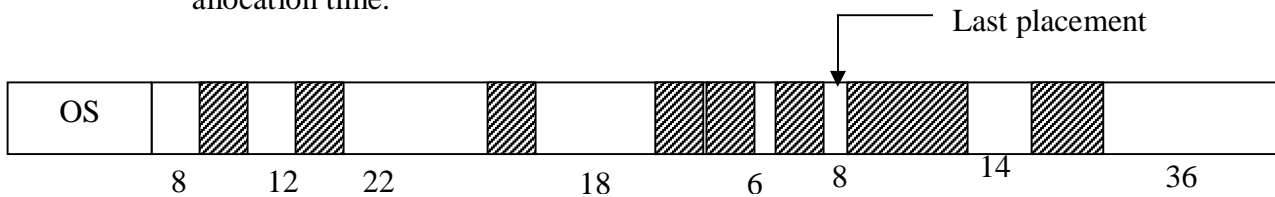
Locate the placement of 7mB followed by 13mB requests using the four dynamic placement algorithms if the last placement is the 8mB space as indicated in the diagram
                                                                   (10mks)

QUESTION FOUR (20 MARKS) ELECTIVE

(a) What is a dispatcher?   (2mks)

(b) Describe the three types of schedulers   (9mks)

(c) Use FCFS, SRTF and HRRN to analyze the following processes

Process	Arrival Time	Burst
P1	0	7
P2	2	1
P3	3	2

                                                                   (9mks)

QUESTION FIVE (20 MARKS) ELECTIVE

(a) State the difference/s between
   - i.   kernel and an operating system   (2mks)

   - ii.   Independent and cooperating processes   (4mks)

(b) List **five** process management activities   (5mks)

(c) Describe **five** main states of a process   (5mks)

(d) Explain **four** benefits of processes synchronization   (4mks)