KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: **COMP 220**

COURSE TITLE: **OPERATING SYSTEMS**

STREAM: **Y2S2**

DAY: **TUESDAY**

TIME: **2.00 – 4.00 P.M.**

DATE: **14/12/2010**

INSTRUCTIONS:

Note: - **Part-A** is compulsory, have **30 marks** and from **Part-B**, You can attempt any **two** questions. Each question has **20 marks.**

PLEASE TURNOVER

PART-A
QUESTION 1

a) Discuss the inconveniences that a user might face while interacting with a computer system, which is without an operating system. **(4Marks)**

b) What are the benefits of multiprogramming? Explain any six. **(5Marks)**

c) Definitions for the following terms:
(i) Program
(ii) Process
(iii) Multiprogramming **(3Marks)**

d) What is the difference between true and concurrent server? **(2Marks)**

e) What are the benefits of parallel systems? Explain any three. **(6Marks)**

f) (i) What are the differences between segmentation and paging?

(ii) Explain an advantages and disadvantages of each. **(4Marks)**

g) Shown below is the workload for 5 jobs arriving at time zero in the order given below:-

Job	Burst
1	10
2	29
3	3
4	7
5	12

Now considering SJF and round robin (RR) [with quantum = 10] algorithms for this set of jobs, find out which algorithm would give the minimum average time. **(6 Marks)**

PART B

QUESTION TWO

a) Differentiates between batch processing system and real time processing system. **(6Marks)**

b) Differentiate between real time system and timesharing system. **(4Marks)**

c) Consider a system with a set of processes P1, P2, P3 and P4. Let their arrival times and CPU burst times mentioned as below:-

Process	Arrival time	CPU Burst time
P1	0	3
P2	1	6
P3	5	4
P4	6	2

Calculate all for FCFS, SJF and RR scheduling algorithms.

(i) Average turnaround time **(3Marks)**

(ii) Average waiting time. **(3Marks)**

(iii)Average throughput. **(2Marks)**

d) What is in a thread control block? **(2Marks)**

QUESTION 3

a) What is scheduling? What criteria affect the performance of various schedulers? Explain any four. **(7Marks)**

b) What is time slicing? How the time slicing duration affects the overall working of the system? **(4Mark)**

c) Explain the following allocation algorithms with advantages and disadvantages.

i. First fit.

ii. Best fit

iii. Next fit. **(6Marks)**

d) How external fragmentation can be avoided. Explain with an example. **(3Marks)**

QUESTION FOUR

a) Explain any three access modes for operation on a file. **(3Marks)**

b) (i) What do understand by file attributes? **(2Marks)**
(ii)Explain any three categories of file attributes? **(3Marks)**

c) (i) Explain SRT scheduling with example. **(2Marks)**
(ii) Give advantages and disadvantages of SRT **(2Marks)**

e) What are the four different objectives which must be considered in the design of scheduling discipline? Explain. **(4Marks)**

f) What factors can lead to the degradation of the performance of round robin (RR) scheduling? **(4Marks)**

QUESTION FIVE

a) What is meant by disk scheduling? Explain why disk scheduling is necessary. **(4Marks)**

b) consider a disk queue with request of I/O to block on cylinder

98, 183, 37, 122, 14, 124, 65, 67

If the disk head is initially at cylinder 53, then calculate total number of head movements using following algorithms:

i. SCAN
ii. LOOK **(6Marks)**

c) (i) What is a deadlock situation. **(2Marks)**

(ii) Explain any four necessary conditions for a deadlock to occur. **(4Marks)**

d) How can we avoid deadlock situation? Justify your answer. **(4Marks)**