KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS
MAIN CAMPUS

THIRD SEMESTER, 2015/2016 ACADEMIC YEAR

EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COMP 216: COMPUTER OPERATING SYSTEMS

STREAM: BSC CS Y2S1 **TIME:** 2 HRS

EXAMINATION SESSION: APRIL **YEAR:** 2017

INSTRUCTIONS

- **(i) Question One is COMPULSORY.**
- **(ii) Attempt any other TWO Questions from the remaining section.**
- **(iii) Do not write on the question paper**
- **(iv) Show your working clearly**

QUESTION ONE (30 MARKS)

Your school wants to buy new operating system for the computers that were donated to your school. Your principal has approached you to help in this exercise, what are the consideration that you will want the school bursar know when going to choose

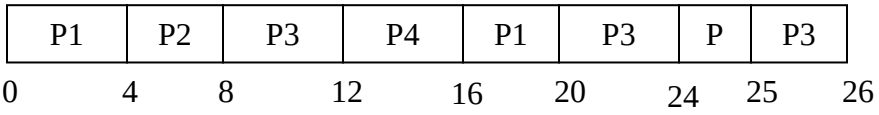
a) an operating system for your school (3 Marks)

b) Explain in brief any four functions of an operating system (8 Marks)

c) What are the differences between trap and interrupt (5 Marks)

d) What is a process? Explain different states of a process with the help of state diagram (6 Marks)

e) Using the Gantt chart below for Round Robin (RR)Scheduling Algorithm of Quantum of 4 ms.



i. Calculate the waiting time for Process P2 and P3 (4 Marks)

ii. Calculate the average waiting time. (4 Marks)

QUESTION TWO (20 MARKS)

a) Distinguish between the following terms

i. Critical sections and Race conditions (2 Marks)

ii. Process and threads (2 Marks).

iii. System calls and virtual memory (2 Marks)

iv. CPU scheduler and CPU dispatcher (2 Marks)

v. Swapping and paging (2 Marks)

vi. Process state and context switch (2 Marks)

b) What are the five major activities of an operating system in regard to process management? (5 Marks)

c) What is process synchronization? (3 Marks)

QUESTION THREE (20 MARKS)

a) Consider a system with a set of processes P_1 P_2 *and* $P_3$and their CPU burst times, priorities and arrival times being mention as below:

Process	CPU burst time	Arrival time	Priority
P_1	6	0	2
P_2	18	1	3
P_3	14	2	1

Assuming 1 to be the highest priority, calculate the following:

i. Average waiting time using FCFS, SJF (Preemptive and Non-preemptive) and priority (Preemptive and Non-preemptive) scheduling mechanism.

(8 Marks)

ii. Average turnaround time using FCFS, SJF (Preemptive and Non-preemptive) and priority (Preemptive and Non-preemptive) scheduling mechanism.

(6 Marks)

iii. Assume time quantum to be 2 units of time. Calculate average waiting time and average turnaround time using Round-Robin scheduling.

(4 Marks)

b) Discuss inter-Process Communication (IPC) (2 Marks)

QUESTION FOUR (30 MARKS)

a) Describe four circumstances under which CPU scheduling decisions may take place (4 Marks)

b) Processes arrive at time 0, with length of the CPU-burst time given in milliseconds.

Process	**Burst Time (Time of CPU use)**
P1	28
P2	6
P3	12

i. If processes arrive in order **P1, P2, P3**; using the **First Come First Served (FCFS)** Scheduling Algorithm, draw a Gantt chart. (2 Marks)

ii. Calculate the Average waiting Time (4 Marks)

iii. If processes arrive in order **P2, P3, P1** using the **First Come First Served (FCFS)** Scheduling Algorithm, draw a Gantt chart. (2 Marks)

iv. Calculate the Average waiting Time for the above (4 Marks)

c) Discuss the **four** necessary condition for a deadlocks to occur in a system (4 Marks)

QUESTION FIVE (30 MARKS)

a) Distinguish between system calls and system programs? (4 Marks)

b) Illustrate how race-condition can be prevented in concurrent processing. (6 Marks)

c) Briefly, describe the advantages of distributed system over centralized systems (5 Marks)

d) Describe different kinds of process interactions (3 Marks)

e) Scheduling selects jobs to be processed in the CPU. Explain four functions of scheduling (2 Marks)

KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND SEMESTER, 2018/2019 ACADEMIC YEAR

EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE
BACHELOR OF BUSINESS MANAGEMENT IN INFORMATION TECHNOLOGY
BACHELOR OF INFORMATION TECHNOLOGY

COMP 216/COMP 220: COMPUTER OPERATING SYSTEMS

STREAM: CS Y2S2/IT Y2S1 **TIME: 9.00-11.00AM**

EXAMINATION SESSION: APRIL **YEAR: 4/04/2019**

INSTRUCTIONS

- **(i) Question One is COMPULSORY.**
- **(ii) Attempt any other TWO Questions from the remaining section.**
- **(iii) Do not write on the question paper**
- **(iv) Show your working clearly**

SECTION A (30 MARKS)

QUESTION ONE (30 MARKS)

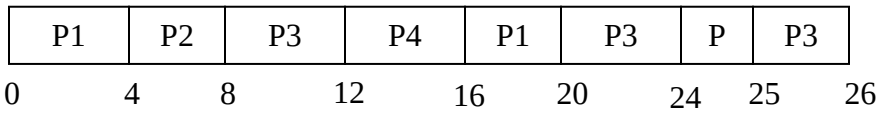
Your school wants to buy new operating system for the computers that were donated to your school. Your principal has approached you to help in this exercise, what are the consideration that you will want the school bursar consider when going to choose an operating system for your school. (3 Marks)

a) Explain in brief any four functions of an operating system. (8 Marks)

b) What are the differences between trap and interrupt. (5 Marks)

c) What is a process? Explain different states of a process with the help of state diagram. (6 Marks)

d) Using the Gantt chart below for Round Robin (RR)Scheduling Algorithm of Quantum of 4 ms.



i. Calculate the waiting time for Process P2 and P3. (4 Marks)

ii. Calculate the average waiting time. (4 Marks)

QUESTION TWO (20 MARKS)

a) Distinguish between the following terms

i. Critical sections and Race conditions (2 Marks)

ii. Process and threads (2 Marks).

iii. System calls and virtual memory (2 Marks)

iv. CPU scheduler and CPU dispatcher (2 Marks)

v. Swapping and paging (2 Marks)

vi. Process state and context switch (2 Marks)

b) What are the five major activities of an operating system in regard to process management? (5 Marks)

c) What is process synchronization? (3 Marks)

QUESTION THREE (20 MARKS)

a) Consider a system with a set of processes P_1 P_2 *and* $P_3$and their CPU burst times, priorities and arrival times being mention as below:

Process	CPU burst time	Arrival time	Priority
P_1	5	0	2
P_2	15	1	3
P_3	10	2	1

Assuming 1 to be the highest priority, calculate the following:

i. Average waiting time using FCFS, SJF (Preemptive and Non-preemptive) and priority (Preemptive and Non-preemptive) scheduling mechanism.

(8 Marks)

ii. Average turnaround time using FCFS, SJF (Preemptive and Non-preemptive) and priority (Preemptive and Non-preemptive) scheduling mechanism.

(6 Marks)

iii. Assume time quantum to be 2 units of time. Calculate average waiting time and average turnaround time using Round-Robin scheduling.

(4 Marks)

b) Discuss inter-Process Communication (IPC). (2 Marks)

QUESTION FOUR (30 MARKS)

a) Describe four circumstances under which CPU scheduling decisions may take place (4 Marks)

b) Processes arrive at time 0, with length of the CPU-burst time given in milliseconds.

Process	**Burst Time (Time of CPU use)**
P1	36
P2	4
P3	8

i. If processes arrive in order **P1, P2, P3**; using the First **Come First Served (FCFS)** Scheduling Algorithm, draw a Gantt chart. (2 Marks)

ii. Calculate the Average waiting Time (4 Marks)

iii. If processes arrive in order **P2, P3, P1** using the First **Come First Served (FCFS)** Scheduling Algorithm, draw a Gantt chart. (2 Marks)

iv. Calculate the Average waiting Time for the above (4 Marks)

c) Discuss the **four** necessary condition for a deadlocks to occur in a system

(4 Marks)

QUESTION FIVE (30 MARKS)

a) Distinguish between system calls and system programs? (4 Marks)

b) Illustrate how race-condition can be prevented in concurrent processing.

(6 Marks)

c) Briefly, describe the advantages of distributed system over centralized systems

(5 Marks)

d) Describe different kinds of process interactions (3 Marks)

e) Scheduling selects jobs to be processed in the CPU. Explain four functions of scheduling . (2 Marks)