



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER**

**SCHOOL OF SCIENCE AND INFORMATION SCIENCES
UNIVERSITY EXAMINATIONS FOR THE DEGREE OF
BACHELOR OF SCIENCE (COMPUTER SCIENCE)**

**COURSE CODE: COM 2207
COURSE TITLE: OPERATING SYSTEMS**

DATE: 26TH APRIL, 2018

TIME: 1100 – 1300 HRS

INSTRUCTIONS

1. Answer Question ONE and any other TWO Questions From Section II
2. Question 1 is compulsory.
3. Time 2HRS
4. *Mobile phones are not allowed in the exam room.*

Section I, Compulsory

(30 marks)

- (a) Give a definition of operating systems. **(2 marks)**
- (b) The operation system takes credit for improving the overall system reliability, explain. **(3 marks)**
- (c) Define and give an example of a proprietary software. **(3 marks)**
- (d) The future of OS technology is on the intelligent environment, identify and explain any two 'intelligent environment systems' **(4 marks)**
- (e) Describe the key milestone in the third generation (1965-1980) operating systems. **(3 marks)**
- (f) Briefly describe the first come first serve (FCFS) Process scheduling algorithm. **(2 marks).**
- (g) Using the table below for the given set of processes, calculate their average waiting time under the algorithm you described in (f) above.

(6 marks)

Process	Arrival Time	Execute Time	Service Time
P0	0	5	0
P1	1	3	5
P2	2	8	8
P3	3	6	16

- (h) Is there a difference between a process and a thread? Explain your answer. **(3 marks)**
- (i) What is the physical address of an instruction with the base register value of the process as 10000 and logical address as 200? **(2 marks)**
- (j) Give any three contents of a process control block (PCB) **(2 marks)**

Section II, Answer any two questions

(40 marks)

Question 2.

(20 marks)

(a) Explain the following terminologies as relates to system processes.

(4 marks)

- (i) Throughput.
- (ii) Turnaround time.
- (iii) Wait time.
- (iv) Response time.

(b) Study the table below and use it to answer the following questions.

Process	Burst time(Ms)	Priority	Arrival time
P1	50	4	0
P2	20	1	20
P3	100	3	40
P4	40	2	60

(i) Briefly describe and Show the schedule for shortest remaining time, non-preemptive priority and round robin with quantum 30Ms. For each of the peach the requested scheduling policy, assume a scale such that 1 unit represents 10 Ms. **(10 marks)**

(ii) What is the average waiting time for each of the above scheduling policies? **(6 marks)**

Question 3.

(20 marks)

(a) Briefly explain any four memory page replacement algorithms.

(8 Marks)

(b) Given the reference (requests) as *c a d b e b a b c d* and a memory system with four frames, determine the number of page faults under (i) optimal page replacement and (ii) FIFO page replacement.

(12 marks)

Question 4.

(20 marks)

- (a) Explain the deadlock problem. **(4 marks)**
- (b) Four conditions need to hold simultaneously for a deadlock to arise, briefly explain each of them. **(8 marks)**
- (c) Briefly describe any four methods you would recommend for handling deadlocks. Give an example of an operating system that uses any of the methods, where available. **(8 marks)**

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