MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER

SCHOOL OF SCIENCE & INFORMATION SCIENCES
BACHELOR OF SCIENCE (COMPUTER SCIENCE)

COURSE CODE: COM 2107
COURSE TITLE: OPERATING SYSTEMS

DATE: 17TH DECEMBER 2018   **TIME: 1100 – 1300HRS**

INSTRUCTIONS TO CANDIDATES

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 examinations room.***

*This paper consists of **3** printed pages. Please turn over.*

SECTION I (Compulsory)
(Answer all Questions in this Section

a) What are the four main structural elements of a computer system?   **(4 marks)**

b) What holds the address of the next instruction to be fetched in the execution of computer programs?   **(2 marks)**

c) Instruction processing consists of two steps outline them.   **(2 marks)**

d) Which routine determines the nature of the interrupt and performs whatever actions are needed.   **(2 marks)**

e) What do you understand by the cache memory?   **(2 marks)**

 f) Briefly describe the role of software in multiprogramming.   **(4 marks)**

g) What do you understand by a "suspended" process?   **(4 marks)**

h) Define a child process.   **(2 marks)**

i) What is swapping?   **(2marks)**

j) What do you understand by an interrupt   **(2 marks)**

k) Define the following: long-term scheduling and short-term scheduling **(4 marks)**

Section II (Answer Question ONE and any other ONE Question from Choice of Two

Question 2

Suppose the following processes arrive for execution at the times indicated and each process will run the listed amount of time in Ms.

In answering the questions below, use preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

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

(a)   Define the terms turnaround time and waiting time.   **(5 marks)**
(b)   What is the average turnaround time for these processes with the FCFS scheduling algorithm?   **(5 Marks)**
(c)   What is the average waiting time for these processes with the SJF scheduling algorithm?   **(5 Marks)**
(d)   What is the average turn-around time for these processes with the SJF scheduling algorithm?

                                                        (5 Marks)

Question 3 (20 marks)
Explain briefly the meaning of the following terms:
(i) Interrupt   (ii) Thread   (iii) ISR   (iv) system call   (v) Process Control Blocks   (vi) context switching   (vii) I/O bound process (viii) CPU bound process   (ix) preemptive scheduling (x) Non-preemptive scheduling
                                                        (20 marks)

Question 4 (20 marks)
a) Using a diagram, identify and describe process states and valid state transitions.
                                                        (10 marks)
b) List four key functions of an operating system and explain each briefly.
                                                        (4 marks)
c) List two other CPU scheduling algorithms (excluding those in Question 1 above) and describe each briefly.   **(6 marks)**

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