MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR**

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

SECOND YEAR FIRST SEMESTER EXAMINATION

COURSE CODE: INS 2104

COURSE TITLE: OPERATING SYSTEMS THEORY

DATE: 11ᵀᴴ DECEMBER, 2018   **TIME: 0830 - 1030 HRS**

INSTRUCTIONS

- Answer Question ONE and any other TWO

SECTION – A
QUESTION ONE (COMPULSORY 30 MARKS)

a) Briefly explain the Types of interfaces. **(3 Marks)**
b) Compare the serial processing with batch processing with an example.
(6 Marks)
c) Explain any two Limitations of buffering. **(4 Marks)**

d) Explain all states of a process. **(5 Marks)**
e) Explain any 4 advantages of distributed systems with an example.
(6 Marks)
h) Differentiate between preemptive and non- preemptive schedule with an example. **(6 Marks)**

SECTION - B:
QUESTION TWO (20 MARKS)

a) Consider the following example of three processes. Use the FCFS scheduling algorithm and find out the average waiting time.
Process   Execution time
P1   12
P2   2
P3   6   **(4 Marks)**
b) What ate the advantages and limitation of FCFS scheduling algorithm?
(4 Marks)
c) Consider the example, there are 3 processes: P1, P2, and P3 which require the following CPU time.
Process   Execution time
P1   24
P2   15
P3   4
P4   7
Use the Round Robin scheduling algorithm and calculate the average turnaround time. **(5 Marks)**
d) (i) What do understand by file attributes? **(2 Marks)**
    (ii)Explain any three categories of file attributes? **(3 Marks)**
e) What is in a thread control block? **(2 Marks)**

QUESTION THREE (20 MARKS)

a) 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) FCFS	**(4 Marks)**
(ii) SSTF	**(4 Marks)**

b) Describe any FOUR issues during CPU scheduling.   **(4 Marks)**
c) Briefly explain any TWO access modes for operation on a file.   **(4 Marks)**
d) Briefly explain the memory hierarchy.   **(4 Marks)**

QUESTION FOUR (20 MARKS)

a) Briefly explain memory management functions.   **(4 Marks)**
b) Explain the Indexed file allocation method with its advantages and limitations.   **(8 Marks)**
c) Consider performance of FCFS algorithm for three compute-bound processes. What if have 3 processes P1 (takes 24 seconds), P2 (takes 3 seconds), and P3 (takes 3 seconds). Their arrival order is P2, P3, P1, what is the

    i. Turnaround Time?
    ii. Throughput?   **(4 Marks)**
d) Explain any FOUR advantages of paged memory management.   **(4 Marks)**

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