MOSHOOD ABIOLA POLYTECHNIC, ABEOKUTA
SCHOOL OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE
FIRST SEMESTER EXAMINATION 2023/2024 SESSION

COURSE TITLE: OPERATING SYSTEM I   COURSE CODE: COM 311

CLASS: COMPUTER SCIENCE   UNIT: 3

LEVEL: HND I (FT & PT)   TIME ALLOTTED: 3HRS

INSTRUCTIONS 1: Attempt **ANY FOUR (4)** Questions in SECTION A and **ANY ONE (1)** Questi
SECTION B

2: Write only your Matric number on this question paper and nothing else.

SECTION A

1 (a). Briefly explain the following CPU scheduling techniques: (i) First Come First Serve (FCFS) (ii) Shortest Job First (SJF) (iii) Priority (iv) Round Robin (RR)
     8 marks

(b). Consider the following set of processes that arrive at the stipulated time with the length of the CPU burst time given in milliseconds.

Process	Arrival time	Burst Time
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5
P_5	4	7

Draw the Grant Chart, calculate the turnaround time and the average waiting time using: (i) FCFS (ii) RR scheduling (quantum time: 4 milliseconds)
     8 marks

(c). Distinguish between Independent processes and Cooperating processes   4 marks

2 (a). How would you describe an Operating System (OS)?   2 marks

(b). Discuss the main goals of OS.   4 marks

(c). Highlight functions (4) of OS.   4 marks

(d). Write on: (i) Kernel (ii) Shell (iii) GUI   6 marks

(e). State two (2) differences between MS-DOS and Windows OS.   4 marks

3 (a). Explain the following OS structures:
     (i). Monolithic Systems   (ii). Layered Systems
     (iii) Virtual Machines   (iv) Exokernels   12 marks

(b). Define: (i) Throughput (ii) Turnaround time (iii) Waiting time (iv) Response time   8 marks

4 (a). Write briefly on these types of OS: (i) Batch Processing OS (ii) Time-sharing OS
(iii) Real time OS (iv) Distributed OS (v) Multiprocessor OS   10 marks
(b). What is Context switching, and how does it affect process management?

                                                                          4 marks
(c). State and explain four (4) conditions for deadlock occurrence.   6 marks

5 (a). What is: (i) a process; and (ii) a thread?   4 marks
(b). In a tabular form, identify five (5) differences between a process and a thread.

                                                                          10 marks
(c). What happens when a process is in: (i) Running state (ii) Blocked state
   (iii) Ready state?
                                                                          3 marks
(d). List three (3) of the information stored in a Process Control Block (PCB).

                                                                          3 marks

SECTION B

Instruction: Attempt only ONE (1) question in this section.
   QUESTION 1
a) Describe the key stages of the Windows OS booting process.   4 marks
b) What is the purpose of memory management in an operating system?   4 marks
c) Explain the purpose of device management in an operating system.   4 marks
d) Explain the concept of process management in an operating system.   4 marks
e) What is the role of the kernel in an operating system?   4 marks

QUESTION 2
a) Explain the key steps involved in the Windows OS booting process.   4 marks
b) What is the primary function of an operating system?   4 marks
c) Explain the difference between logical and physical addresses in memory management.

                                                                          4 marks
d) Explain the concept of device drivers and their importance in an operating system.   4 marks
e) What is the purpose of the kernel in an operating system, and what are its main
responsibilities   4 marks