BENNETT UNIVERSITY
THE TIMES GROUP

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Department/ School: SCSET

MID-TERM EXAMINATION, EVEN SEMESTER MARCH 2024

COURSE CODE: CSET209
COURSE NAME: OPERATING SYSTEMS
PROGRAM: B.tech

MAX. DURATION **1 HRS**

TOTAL MARKS **20**

Mapping of Questions to Course and Program Outcomes										
Q. No.	A1	A2	A3	A4	A5	B1	B2	B3	B4	
CO	2	2	1	1	1	1	2	2	2	
PO	1	1	2	2	2	1	1	2	1	

GENERAL INSTRUCTIONS: -

1. Do not write anything on the question paper except **name, enrolment number** and **department/school.**
2. Carrying mobile phones, smartwatches and any other non-permissible materials in the examination hall is an act of **UFM.**

COURSE INSTRUCTIONS:

a) All questions are compulsory. There are two sections A and B. Attempt all questions of each section at one place.

b) Write your **Group number and batch number on the top of your answer sheets.**

SECTION A

Max Marks: 8

A1) Fill in the blanks: **(2 Marks)**

1.) If the time quantum is extremely small (say, 1 millisecond), the RR approach can result in a large number of ----------

2.) If the time quantum is extremely large, the RR policy is the same as the ---------- policy.

3.) ---------- determines the degree of multi programming in the system.

4.) ---------- is the time from the submission of a request until the first response is produced.

A2) Considering the case of Round Robin scheduling, suppose there are 10 processes in the ready queue and time quantum of 10 milli seconds. For what maximum amount of time, a process has to wait for his execution? **(1 Mark)**

A3) In the context of Priority scheduling, explain aging with the help of a suitable example. **(2 Marks)**

A4) What is a system call in Operating Systems? Give examples of system calls for process management and file management in Windows and Linux operating systems. **(2 Marks)**

A5) What is a thread and why it is called as a light weight process? **(1 Mark)**

SECTION B

Max Marks:12

B1) Describe the role of Dispatcher in an Operating System. Also, describe dispatch latency with a suitable block diagram. **(3 Marks)**

B2) Consider 3 processes in a system P1, P2, and P3 with their arrival and burst times as shown in Table 1. If the system uses Shortest Remaining Time First algorithm to schedule these processes on the CPU, answer the following questions. **(3 Marks)**

a) Design the Gantt Chart to illustrate the schedule of processes.
b) Calculate the waiting time for each process and the average waiting time.
c) Calculate the Turnaround time for each process and the average Turnaround time.

Table 1

Process No.	Arrival Time (milli secs)	Burst Time (milli secs)
P1	0	9
P2	1	4
P3	2	9

B3) a.) What is a Race condition? **(1.5 marks)**

b.) What are the three requirements for a solution to the critical section problem? **(1.5 marks)**

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Q4) Consider 5 processes in an operating system which uses priority scheduling (non-preemptive) for allocating CPU. Based on the arrival times, burst times and priorities of these processes given in Table 2, answer the following questions (lower number implies higher priority). **(3 Marks)**

a) Design the Gantt Chart to illustrate the schedule of processes.

b) Calculate the waiting time for each process and the average waiting time.

c) Calculate the Turnaround time for each process and the average Turnaround time.

Table 2

Process id	Arrival Time (milli secs)	Burst Time (milli secs)	Priority
P1	0	4	5
P2	1	3	5
P3	2	1	4
P4	3	5	3
P5	4	2	2

+3 12- 11

-ALL THE BEST-