

Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	Programme	B. Tech. in CSE
Semester/Batch	5 th / 2020		
Course Code	19CSC304A	Course Title	Operating Systems
Course Leader(s)	Ms. Jishmi Jos Choondal/Ms. Naveeta		

Assignment					
Register No.		Name of Student			
Sections		Marking Scheme	Max Marks	First Examiner Marks	Moderator Marks
Question 1	Q1.1	Introduction to multi-programming	01		
	Q1.2	Effect of multi-programming on CPU utilisation	04		
		Question 1 Max Marks	05		
Question 2	Q2.1	Design and implementation of the application using sequential approach with functions	04		
	Q2.2	Design and implementation of the application using multithreaded approach	04		
	Q2.3	Comparison of the execution time of the above two versions of the program and its analysis	02		
		Question 2 Max Marks	10		
Q3.1		Schedule of the processes using a Gantt chart	04		

	Q3.2	Average waiting time and average turnaround time experienced	04		
	Q3.3	Scheduling algorithm with better performance and its justification	02		
		Question 3 Max Marks	10		
	Total Assignment Marks		25		

Course Marks Tabulation				
Component- 1(B) Assignment	First Examiner	Remarks	Moderator	Remarks
Q1				
Q2				
Q3				
Marks (out of 25)				
<div>Signature of First Examiner</div> <div>Signature of Second Examiner</div>				

Instructions to students:

1. Maximum marks is **25**
2. The assignment has to be neatly word processed as per the prescribed format.
3. The maximum number of pages should be restricted to **8**
4. The printed assignment must be submitted to the course leader.
5. **Submission Date: 28/11/2020**

Assignment

Question 1:

(5 Marks)

Write an essay on " The effect of multi-programming on CPU utilisation".

1.1 Introduction to multi-programming.

1.2 Effect of multi-programming on CPU utilisation for single core and multicore systems.

Question 2

(10 Marks)

Design and implement a program to add two $m \times n$ matrices ($n \geq 100$ and $m \geq 100$). In order to perform the above, two versions of the program need to be implemented, one, a sequential version and the other a concurrent version. The sequential version implements a function to add the two matrices. The concurrent version of the program spawns threads, each thread to add assigned number of rows. The main thread computes the consolidated output matrix.

Perform the following using file management system calls:

- 2.1 Design and implement the application using sequential approach with functions
- 2.2 Design and implement the application using multithreaded approach
- 2.3 Compare the execution times of the above two versions of the program and analyse their performance

Question 3

(10 Marks)

Consider a priority based scheduling with highest number implying highest priority. Processes with their burst time, arrival time and priority are given in Table1.

Processes	Burst Time (ns)	Arrival Time (ns)	Priority
1	10	15	6
2	15	20	8
3	5	25	2
4	12	10	4

Table 1

Determine the following for preemptive and non-preemptive priority scheduling algorithms.

- 3.1 Schedule of the processes using a Gantt chart
- 3.2 Average waiting time and average turnaround time experienced
- 3.3 Scheduling algorithm with better performance and its justification