PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019 - 20 Examination

Semester: 3   Date: 27/11/2019
Subject Code: 203105203/03105202   Time: 2:00pm to 4:30pm
Subject Name: Operating System   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions -   **(15)**

1. Which of the following requires a device driver?

   a) Register   b) Cache

   c) Main memory   d) Disk

2. Virtual memory implements the translation of a program's address space into physical   memory

   address space (T/F)

3. Write full form of TLB

4. Time quantum is defined in_____scheduling algorithm.

5. The Process Control Block is:

   a) Process type variable   b) Data Structure

   c) A secondary storage section d) A Block in memory

6. To access the services of operating system, the interface is provided by the API (T/F)

7. A process executes the code

   ```
   fork ();
   fork ();
   fork ();
   ```

   The total number of child processes created is

   (A) 3   (B) 4   (C) 7   (D) 8

8. The segment of code in which the process may change common variables, update tables, write into

   files is known as:

   (A) Program   (B) Critical section

   (C) Non – critical section   (D) Synchronizing

9. _____ scheduling algorithm is non-preemptive

10. Shortest remaining time first scheduling may cause starvation (T/F)

11. In which one of the following page replacement policies, Belady's anomaly may occur?

    (A) FIFO   (B) Optimal

    (C) LRU   (D) MRU

12. Increasing the RAM of a computer typically improves performance?(T/F) state reason

13. _____ is time taken by the head to travel to the track of the disk where the data to be

    accessed is stored.

14. Producer Consumer problem is also known as _____.

15. The rule "No two processes may be simultaneously inside the same critical section" is known as?

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Enlist memory management Techniques.

B) Briefly explain Multiprogramming Operating System with its advantages & disadvantages.

C) Define process and Explain process states in details with diagram

D) What are the differences of internal and external memory Fragmentation?

Q.3 A) Consider the following page reference string. **(07)**

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults would occur for the following replacement algorithm, assuming 3 frames respectively as well as State advantages and disadvantages of both methods.?

a. LRU page replacement.   b. FIFO page replacement.

B) What is semaphore? Discuss product-consumer problem with semaphore. **(08)**

OR

B) What is Deadlock? Assume that there are 5 processes, P0 through P4, and 4 types of resources. At **(08)** T0 we have the following system state:

	Allocation Matrix				Max Matrix				Available Matrix			
	A	B	C	D	A	B	C	D	A	B	C	D
P₀	0	1	1	0	0	2	1	0	1	5	2	0
P₁	1	2	3	1	1	6	5	2				
P₂	1	3	6	5	2	3	6	6				
P₃	0	6	3	2	0	6	5	2				
P₄	0	0	1	4	0	6	5	6				
Total	2	12	14	12								

[1] Create the Need Matrix.

[2] Determine the state is safe or not using Banker's Algorithm. (If yes, safe state then what is the safe sequence).

 [3] Process P1 request for (A, B, C, D) = (2, 1, 1, 0) additional resource. Can resource request be granted immediately?

Q.4 A) What is Race Condition? Explain Peterson's solution for the race condition with algorithm. **(07)**

OR

A) Consider the following set of processes, with the length of the CPU burst given in milliseconds: **(07)**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

a) Draw Gantt charts illustrating execution of these processes for FCFS and round robin (quantum=1)

b) What is the turnaround time of each process for each of the scheduling algorithms in part a?

c) What is the waiting time of each process for each of this scheduling algorithm?

B) Explain different Disk scheduling algorithms SCAN,CSCAN,LOOK,CLOOK with example.   (08)