PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2021 - 22 Examination

Semester: 4   Date: 20-04-2022
Subject Code: 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.

Q1. (A) Fill in the blanks: 05
1. Information related to process is stored in_____
2. Suppose that process is in BLOCK state and waiting for some I/O services when service is Completed, it goes to the _____ state.
3. Time quantum is defined in _____ Scheduling algorithm.
4. Logical address is generated by_____
5. To execute a Task page not found by CPU in main memory is called_____

(B) Do the following multiple-choice questions: 05
6. What is Compaction?
  a. Technique for overcoming external Fragmentation
  b. Thrashing
  c. Technique for overcoming internal Fragmentation
  d. None of the above

7. Internal fragmentation never occur in variable partition scheme?
a. True   b. False
c. May be occurred   d. None of the above

8. In paging size of the page is 4 Byte, frame size will be?
a. 2 Byte   b. 4 Byte
c. 16 Byte   d. All of the above

9. What is an example of character device?
a. Hard disk   b. USB
c. Keyboard   d. both a and b

10. Threads belongs to
a. exactly one process and inside a process   b. outside a process
c. More than one process   d. None of the above

(C) Do the following short questions: 05
11. List out the types of threads.
12. List out the process states.
13. Write one difference between preemptive and non-preemptive scheduling.
14. What is the function to create child process?
15. What is the full form of TLB?

Q.2 Attempt any three: **15**

(A) List out the types of operating system. Explain distributed operating system with a suitable example.

(B) Explain different services of an operating system.

(C) Explain internal and external fragmentation with a suitable example?

(D) What is deadlock? How will you detect single resource deadlock? Give a suitable example.

Q3. **(A)** Consider the following 5 process P1, P2, P3, P4, P5 with burst time and arrival time.   **07**

Process	Burst Time	Arrival Time
P1	6	2
P2	2	5
P3	8	1
P4	3	0
P5	4	4

Calculate average waiting time for preemptive FIFO (first in first out) & SJF (Shortest Job First).

(B) Consider the page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2 with 4 pages frames.   **08**
Find the number of page faults by using FIFO (first in first out) & LRU (Least Recently Used) Page Replacement Algorithm.

(or)

(B) Explain the following terms: **08**
     (a) Belady's Anomaly
     (b) Thrashing
     (c) DMA
     (d) Producer Consumer problem using Semaphore

Q4. **(A)** Consider a system which has LA=7 bits, PA=6 bits, page size =8 Byte   **07**
     Calculate number of pages and frames.
(or)

(A) What is paging? Explain paging in operating system with a suitable example.   **07**

(B) What is segmentation? Consider the following segment table   **08**

Segment	Base	bound/size
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?
1) 0, 430
2) 2, 500