

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER- 2 • EXAMINATION – SUMMER 2020**

**Subject Code: 3620003****Date: 06-11-2020****Subject Name: Operating Systems****Time: 10:30 AM TO 01:00 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Define Terms: **07**  
 i) JCL,      ii) Race Condition,    iii) Monitor,      iv) Virtual Memory  
 iv) SMP,    iv) Dispatcher      v) Process      vi) Starvation  
 vii) TLB
- (b)** Do as directed. **01**  
 i) Say TRUE or False: “The deadlock avoidance strategy does not predict deadlock with certainty”.  
 2) Give one difference between Monolithic and Microkernel. **01**  
 3) Give one difference between Batch multi-programming and Time sharing. **01**  
 4) Give one example of consumable and reusable resource. **01**  
 5) Explain first-fit, best-fit, next-fit placement policies **03**
- Q.2 (a)** Explain the utility of Process Control Block. What kind of information is stored in it? **07**
- (b)** What is memory management? Explain Dynamic partitioning. Why we need compaction? **07**
- OR**
- (b)** Please comment - Dynamic partitioning is better than fixed partitioning. **07**
- Q.3 (a)** Compare User Level Thread ( ULT) with Kernel Level Thread(KLT). **07**  
**(b)** What is Deadlock? Discuss Banker's algorithm. **07**
- OR**
- Q.3 (a)** Explain Seven-state Process Model mentioning all its transitions. **07**  
**(b)** What is mutual-exclusion? List requirements of it. **07**
- Q.4 (a)** Explain Counting semaphores with its operations. How it is different from Binary Semaphore? **07**  
**(b)** Explain the buddy system with proper example. **07**
- OR**
- Q.4 (a)** Explain Producer Consumer Problem solution to the bounded buffer using counting semaphore. **07**  
**(b)** What is paging? Explain the logical to physical address translation mechanism with example. **07**
- Q.5 (a)** i) What is DMA? How it works? **04**  
 ii) Discuss any three Levels of Redundant Array of Independent Disks (RAID) in detail. **03**
- (b)** List objective of Scheduling. Discuss Round Robin (RR) scheduling algorithm. What is the importance of quantum in RR? **07**

**OR**

- Q.5** (a) i) List various file organizations. Explain any two in detail. **04**  
ii) Explain various types of buffering in detail. **03**  
(b) i) Given the following data, calculate Turnaround Time for each process and average Turnaround for all processes using FCFS and SPN algorithms. **05**

Process	A	B	C	D	E
Arrival Time	0	2	4	6	8
Service Time	3	6	4	5	2

- ii) Which algorithm is better for smaller jobs, SPN or FCFS?, Why? **02**

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