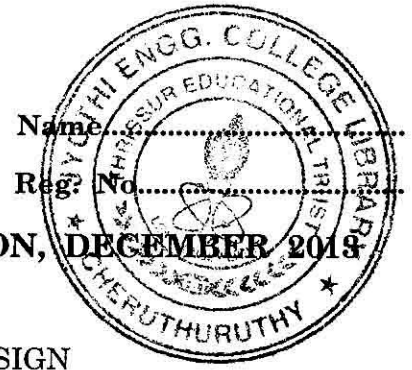


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Name:
Reg. No:

FIRST SEMESTER M.TECH. DEGREE EXAMINATION, DECEMBER 2018

**Computer Science and Engineering
MCS 10 102—OPERATING SYSTEM DESIGN**

Time : Three Hours

Maximum : 100 Marks

Answer any five questions by choosing at least one question from each module.

MODULE I

1. (a) Explain the sequence of actions during context switching caused by an interrupt. (5 marks)
- (b) Explain the architecture of Operating system. (5 marks)
- (c) Discuss the essential properties of the following operating systems :
 - (i) Batch.
 - (ii) Time shared.
 - (iii) Real-time.
 - (iv) Distributed.

Or

2. (a) Explain how pipes allow to use variable sized messages ? What are the advantages of named pipes over pipes with internal names ? Are there any disadvantages ? (10 marks)
- (b) Explain the working client-server IPC pattern. Write code for file server with clients. (10 marks)

MODULE II

3. (a) What is the distinction between competing process and co-operating process ? (5 marks)
- (b) Consider the following set of five processes arrive in order P1, P2, P3, P4, P5 at time 0 with CPU-burst time and priority given in milliseconds.

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

- (i) Draw Gantt chart illustrating the execution of these processes using FCFS, SJF, non-preemptive priority (smaller priority number implies higher priority) and Round Robin (quantum = 1) scheduling.

Turn over

- (ii) What is the turnaround time of each process for each scheduling algorithms in part I ?
 - (iii) What is the waiting time of each process for each scheduling algorithms in part I ?
(15 marks)
4. (a) Two-phase locking can lead to starvation. Explain how this can happen. Explain why deadlock is not possible.
(8 marks)
- (b) Explain in detail the working of following synchronization primitives with example :
- (i) Monitor.
 - (ii) Rendezvous.
 - (iii) Protected variables.
(12 marks)

MODULE III

5. (a) What are the advantages and disadvantages with two-level paging ? (5 marks)
- (b) Explain the concept of disk caching. (5 marks)
- (c) Explain general clock algorithm for page replacement. (10 marks)
6. (a) What are the similarities and difference between serial port controller and SCSI controller ?
(8 marks)
- (b) A disk unit has 12 recording surfaces 7000 cylinders. There is an average of 200 sectors per track and each sector has 512 bytes of data.
(12 marks)
- (i) What is the maximum number of bytes that can be stored in this unit ?
 - (ii) What is the data transfer rate in bytes per second at a rotational speed of 7200 r.p.m. ?

MODULE IV

7. (a) Explain the working of pathname lookup algorithm in directory implementation with relevant flowcharts.
(10 marks)
- (b) Explain the concept of file system mounting. How does mounting change pathname lookup algorithm.
(10 marks)
8. (a) Advantages of log structured file system. (5 marks)
- (b) Describe mechanisms adopted to improve reliability of file system. (5 marks)
- (c) Explain various mechanisms by the operating system to ensure software protection.
(10 marks)