

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**Fourth Semester of B. Tech (CE) Examination December 2016****CE221/CE221.01 Operating System****Date: 05.12.2016, Monday****Time: 01.30 p.m. To 04.30 p.m.****Maximum Marks: 70****Instructions:**

1. The question paper comprises two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make and Mention suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I**Q - 1 Do as Directed. [09]****[A] Answer the following questions. [05]**

1. Define: Operating System
2. Define: Thread
3. State True/False: Inode is associated with each file.
4. What is deadlock?
5. What is kernel?

[B] Answer the following questions. [04]

1. List out any four functions of the operating system.
2. List out different states of a process.

Q - 2 Answer the following questions. (Attempt Any Three) [12]

- [A]** What is Process Control Block (PCB)? List and describe different fields of PCB.
- [B]** Which are the four conditions must hold for there to be a deadlock. Describe each in brief.
- [C]** What is buffer cache? Which are the different fields in buffer header?
- [D]** Explain Counting and Binary semaphore.

Q - 3 Answer the following questions.(Attempt Any Two) [14]

- [A]** Consider the following set of processes in order P1, P2, P3 and P4 with the length of the CPU burst time given in milliseconds. Calculate average waiting time and turnaround time using FCFS and SJF scheduling algorithm. Draw Gantt chart for both scheduling algorithm.

Process	Arrival Time	Burst Time
P1	0	9
P2	1	7
P3	2	6
P4	3	7

- [B] Which are the different methods to handle deadlock? Give brief description about each method.
- [C] What is semaphore? Describe Producer-consumer problem and its solution using semaphores.

SECTION – II

Q - 4 Do as Directed. **[09]**

[A] **Answer the following questions.** **[05]**

1. Paging Suffers from which fragmentation?
2. .txt and .doc are which type of file?
3. Define: System Call
4. Define: Distributed Operating System
5. What is Multiprocessor System?

[B] **Answer the following questions.** **[04]**

1. What is Internal Fragmentation? Explain with suitable example.
2. I/O devices divided into two categories: Block and Character devices. What is Block device and give two example of it.

Q - 5 Answer the following questions. (Attempt Any Three) **[12]**

[A] What are the physical addresses for the logical addresses given below?

(1) < 1, 245 > (2) < 3, 100 > (3) < 2, 100 > (4) < 0, 90 >

Use following Segment Table.

Segment Number	Base Address	Length
0	300	100
1	100	200
2	500	245
3	800	200

- [B] Explain Best fit and First fit Memory allocation policies.
- [C] Suppose that a disk has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 34, and the previous request was at cylinder 100. The queue of pending request is: 98, 183, 37, 122, 14, 124, 65 and 67. Find total head movement for FCFS and SCAN disk scheduling algorithms.(Show diagram of Head movement)
- [D] List out and explain any four file attributes.

Q - 6 Answer the following questions. (Attempt Any Two)

[14]

- [A] What is the length of the string? How many Page Fault occur for the FIFO (First In First Out), LRU (Least Recently Used) & Optimal page replacement algorithm with 3 frames? (Pure Demand Paging)
Reference String: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3
- [B] What is DMA (Direct Memory Access)? Explain DMA with proper diagram and operation of a DMA transfer.
- [C] Explain Linked Allocation and Indexed Allocation methods of Disk space allocation to a file with proper diagram. Also give advantages and disadvantages of each method.
