

III B. Tech I Semester Regular Examinations, Dec/Jan -2022-23
OPERATING SYSTEMS

(Common to CE,EEE,ME,ECE)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Explain different operating system structures with neat sketch. [7M]
 b) Describe the various types of system calls with examples. [7M]
 (OR)
2. a) Explain the concept of multiprocessor and Multi-core organization. [7M]
 b) What are the advantages and disadvantages of using the same system call interface for both files and devices? [7M]

UNIT-II

3. a) Discuss about the Inter Process Communication models. [7M]
 b) Describe the process life cycle with a neat diagram. [7M]
 (OR)
4. a) Explain about various process states in with neat Diagram. [7M]
 b) Discuss about Process control block with diagram. [7M]

UNIT-III

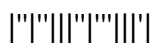
5. a) Explain about given memory management techniques. (i) Partitioned allocation (ii) Paging and translation look-aside buffer. [7M]
 b) When page faults will occur? Describe the actions taken by operating system during page fault. [7M]
 (OR)
6. Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. Identify the number of page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, or seven frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each. a) LRU replacement b) FIFO replacement c) Optimal replacement. [14M]

UNIT-IV

7. a) State critical section problem? Discuss three solutions to solve the critical section problem. [7M]
 b) Explain dining philosopher's problem. [7M]
 (OR)
8. a) Discuss about Deadlock characterization with necessary conditions. [7M]
 b) Explain about Deadlock Prevent mechanisms. [7M]

UNIT-V

9. a) Explain about File Attributes and File Operations. [7M]
 b) Discuss about File types, File structure and File Internal structure. [7M]
 (OR)
10. a) Explain about Link Allocation in Disk Space. [7M]
 b) Discuss about the types of File Access methods. [7M]



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UNIT-I

1. a) Describe the difference between symmetric and asymmetric multiprocessing. Discuss the advantages and disadvantages of multiprocessor systems. [7M]
- b) Explain how protection is provided for the hardware resources by the operating system. [7M]

(OR)

2. a) List the various services provided by operating systems. [7M]
- b) With neat sketch, discuss about computer system. [7M]

UNIT-II

3. a) Discuss about process scheduling based on queues with diagram [7M]
- b) Explain different types of scheduler with diagram [7M]

(OR)

4. a) Explain various types of operations based on processes. [7M]
- b) Discuss about message passing systems [7M]

UNIT-III

5. a) Compare paging with segmentation in terms of the amount of memory required by the address translation structures in order to convert virtual addresses to physical addresses. [7M]
- b) Differentiate local and global page replacement algorithm. [7M]

(OR)

6. a) Explain the Steps in handling a page fault with neat Diagram. [7M]
- b) Compare FIFO and Optimal Page replacement algorithm with example. [7M]

UNIT-IV

7. a) Discuss about synchronization hardware. [7M]
- b) Explain semaphore usage and implementation. [7M]

(OR)

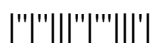
8. a) Explain about Resource allocation based on Deadlock. [7M]
- b) Describe bankers algorithm for Deadlock Avoidance. [7M]

UNIT-V

9. a) Explain about the types of File Access methods. [7M]
- b) Discuss about System Mounting mechanism with neat Diagram. [7M]

(OR)

10. a) Explain about Indexed Allocation method in disk space. [7M]
- b) Give various types of directory implementation. [7M]



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UNIT-I

1. a) Explain about user and Operating system Interface. [7M]
 b) Define a system call. Discuss about types of system calls. [7M]
 (OR)
2. a) Discuss various operations of Operating System. [7M]
 b) Explain about major components of operating system with a neat diagram. [7M]

UNIT-II

3. a) What is a Process Control Block? Explain its structure with neat Diagram. [7M]
 b) Discuss about various operation on processes. [7M]
 (OR)
4. a) What are the various key points of scheduling criteria? [7M]
 b) Explain about the control block in process. [7M]

UNIT-III

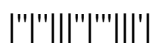
5. a) Explain about swapping mechanism based on Memory management with neat diagram. [7M]
 b) Discuss about memory allocation and Fragmentation. [7M]
 (OR)
6. a) Discuss about Performance of Demand paging. [7M]
 b) Explain why sharing a reentrant module is easier when segmentation is used than when pure paging is used with example. [7M]

UNIT-IV

7. a) Explain about Round Robin scheduling with on example. [7M]
 b) Discuss about Multi-Level Queue Scheduling. [7M]
 (OR)
8. a) Explain about Circular-wait method in Deadlock prevention with example. [7M]
 b) Discuss about Deadlock Detection methods. [7M]

UNIT-V

9. a) What are various Remote File system mechanisms? Explain them. [7M]
 b) Discuss about Access Control based on File system. [7M]
 (OR)
10. a) Elaborate on layered File system structure. [7M]
 b) Explain the types of the directory implementation. [7M]



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UNIT-I

1. a) Discuss about operating system structures with neat sketch. [7M]
 b) Explain about various operations of operating system. [7M]

(OR)

2. a) Discuss about the protection mechanism of the hardware resources by the operating system. [7M]
 b) Explain about user and Operating system Interface. [7M]

UNIT-II

3. a) Compare and contrast various schedulers used for process management. [7M]
 b) Discuss about message passing system with example. [7M]

(OR)

4. a) Discuss about the types of CPU Scheduler [7M]
 b) Explain the difference between preemptive and non-preemptive scheduling. [7M]

UNIT-III

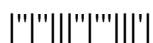
5. a) Discuss situation under which the most frequently used page replacement algorithm generates fewer page faults than the least frequently used page replacement algorithm. Also discuss under which circumstances the opposite holds. [7M]
 b) Explain about Hierarchical Paging. [7M]

(OR)

6. a) Most systems allow programs to allocate more memory to its address space during execution. Data allocated in the heap segments of programs is an example of such allocated memory. What is required to support dynamic memory allocation in the following schemes? i) Contiguous memory allocation ii) Pure segmentation iii) Pure paging [7M]
 b) What is copy-on write feature and under what circumstances it is beneficial? What hardware support is needed to implement this feature? [7M]

UNIT-IV

7. a) What is Readers-writers problem? How to solve it? [7M]
 b) Discuss about Dining-Philosophers problem based on Monitors. [7M]
 (OR)
8. a) Explain about Recovery from Deadlock. [7M]
 b) Discuss about the safety Algorithm and Resource Request Algorithm based on Deadlock Avoidance. [7M]



UNIT-V

9. a) What is a directory? Explain about the logical structure of Directory. [7M]
b) Discuss about Remote file system. [7M]
(OR)
10. a) Explain about Indexed Allocation method in disk space. [7M]
b) Discuss about File System Mounting mechanism with neat Diagram. [7M]

