

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**OPERATING SYSTEMS**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

- 1 a) Describe the typical elements of the process control block. [3M]
- b) Define System Call? List out any four Process Control System Calls. [4M]
- c) Distinguish between counting and binary semaphores. [4M]
- d) What is the purpose of paging the page tables? [4M]
- e) Discuss the Safe, unsafe, and deadlock state spaces. [3M]
- f) What is a File? Describe the attributes of a file. [4M]

**PART -B**

- 2 a) Explain the Time-shared operating system. [4M]
- b) Discuss the Simple Operating System Structure. Describe the layers of the Kernel. [8M]
- c) Explain the difference between micro-kernel and macro-kernel. [4M]
- 3 a) Compare and contrast thread and process. [3M]
- b) Define Process. Explain various steps involved in change of a process state with process state neat transition diagram. [8M]
- c) Discuss Multithreading Models with neat diagrams. [5M]
- 4 a) What is a Critical Section? Discuss the solution of the Critical Section problem. [8M]
- b) Explain in detail Readers and Writers Problem of Synchronization. [8M]
- 5 a) Discuss the procedure for handling the page fault in demand paging. [8M]
- b) Illustrate the page-replacement algorithms i) FIFO ii) Optimal Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames. [8M]
- 6 a) How to Recover From Deadlock situations? Discuss in detail. [8M]
- b) Explain deadlock avoidance process using Resource-Allocation-Graph. [8M]
- 7 a) Write short notes on: i) FCFS and ii) SSTF Disk Scheduling schemes. [8M]
- b) Discuss the Indexed File allocation method with an example. [8M]

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PART -A

- 1 a) Draw MS-DOS Operating System structure. [3M]
- b) Describe different attributes of the process. [4M]
- c) Define Busy Waiting? How to overcome busy waiting using Semaphore operations. [4M]
- d) Why segmentation and paging are sometimes combined into one scheme? [4M]
- e) Discuss the usage of wait-for graph scheme. [3M]
- f) Explain the information associated with an open file. [4M]

PART -B

- 2 a) Discuss UNIX Operating system structure. [4M]
- b) Explain different categories of System calls with suitable examples. [8M]
- c) Define Multitasking. Discuss the Timeshared operating System. [4M]
- 3 a) Differences between preemptive scheduling and non preemptive Scheduling. [3M]
- b) What is IPC? Explain in detail the inter process communication models [8M]
- c) Describe the differences among short-term, medium-term, and long term Schedulers. [5M]
- 4 a) What is Peterson's Solution? Discuss the Critical Section problem using Peterson's Solution. [8M]
- b) Explain in detail Synchronization implementation in Linux. [8M]
- 5 a) What is demand paging? Discuss the hardware support required to support demand paging. [8M]
- b) Illustrate the page-replacement algorithms i) LRU ii) LRU-Approximation Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames. [8M]
- 6 a) Discuss deadlock avoidance using banker's algorithm with suitable example. [8M]
- b) Explain Deadlock Detection scheme for Several Instances of a resource Type. [8M]
- 7 a) Explain various file access methods with suitable examples. [8M]
- b) Discuss the Schematic view of a virtual file system with neat sketch. [8M]

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- 1 a) What are Operating-System Services? [3M]
- b) Describe the benefits of multithreaded programming. [4M]
- c) Describe disadvantages of the semaphore. [4M]
- d) Explain why sharing a reentrant module is easier, when segmentation is used than when pure paging is used. [4M]
- e) Describe the Methods for Handling Deadlocks. [3M]
- f) Discuss UNIX File System Mounting. [4M]

PART -B

- 2 a) Explain the overview of an Operating system with neat sketch. [4M]
- b) Describe essential properties of Real Time and Network operating Systems [8M]
- c) Explain models of distributed systems. [4M]
- 3 a) What is a Scheduler? Describe different CPU Schedulers. [5M]
- b) Define starvation. Which of the scheduling algorithms result in starvation? Explain. [6M]
- c) Describe the actions taken by a kernel to context-switch between processes [5M]
- 4 a) Define atomic instruction. Explain with an example. [4M]
- b) Explain wait and signal semaphore operations without busy waiting. [4M]
- c) Give a solution for second Readers-Writers problem. [8M]
- 5 a) Explain implementation of virtual memory through Demand Paging. [8M]
- b) Discuss the Hierarchical Paging structure. [8M]
- 6 a) Discuss deadlock avoidance using Resource-Allocation-Graph Algorithm. [8M]
- b) Explain Deadlock detection algorithm with an example. [8M]
- 7 a) Explain different operations on File. [8M]
- b) Write short notes on :i) Contiguous and ii) Linked File allocation methods [8M]

Code No: RT31055

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SET - 4

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PART -A

- 1 a) Describe the Operating-System Operations. [3M]
- b) Define Cooperating process? What is the environment need in Cooperating processes? [4M]
- c) What is a Monitor? Give the schematic view of the basic monitor. [4M]
- d) Write short note on demand paging. [4M]
- e) What is the usage of Resource-Allocation Graph? [4M]
- f) Define the terms seek time & rotational latency. [3M]

PART -B

- 2 a) What is an Operating system? Describe the Operating-System Functions. [4M]
- b) Explain briefly Layered Operating system structure with neat sketch [8M]
- c) Differentiate protection and security. [4M]
- 3 a) Explain Inter Process Communication models in detail. [8M]
- b) What are the differences between user-level threads and kernel-level threads? [4M]
- c) Explain allocation and de allocation of resources when a process is created & terminated respectively in UNIX. [4M]
- 4 a) Give a solution to Readers-Writers problem using Monitors. [8M]
- b) Define semaphore? Explain the usage and implementation of semaphores. [8M]
- 5 a) What is the cause of thrashing? How does the system detect thrashing? How to eliminate this problem? [8M]
- b) What is Paging? Discuss the Paging model of logical and physical memory. [8M]
- 6 a) What is a deadlock? Consider the deadlock situation that could occur in the dining philosopher's problem when the philosophers obtain the chopsticks one at a time. Discuss how the four necessary conditions for deadlock indeed hold in this setting. What are the solutions for this problem? [8M]
- b) Explain recovery from deadlock after detection. [8M]
- 7 a) Discuss various types of disk storage attachments. [8M]
- b) Explain File Free Space management approaches. [8M]
