

Code No: **R17A0513****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020**Operating Systems****(CSE & IT)**

Roll No									
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Time: 2 hours**Max. Marks: 70**

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 a. Discuss about time shared operating systems.
b. Explain Computer system architecture & OS structure with neat diagrams.
- 2 a. Explain various components in the Operating System structure.
b. Discuss about virtual machines in detail.
- 3 a. Consider the following data of set of processes and compute Turn Around Time for Round Robin scheduling with time quantum=3.

Process	Burst Time	Arrival Time
P1	10	0
P2	5	0
P3	15	4
P4	10	9
P5	21	14

- b. Discuss about semaphores in process synchronization.
- 4 a. Discuss various states of the process with neat diagram
b. Explain peterson's solution for critical section problem in detail.
- 5 a. Explain about paging and page table structure in detail.
b. Write about LRU page replacement technique with example.
- 6 a. Write short notes on swapping and contiguous allocation.
b. Discuss about Optimal Page Replacement technique with example.
- 7 Explain the following with appropriate diagrams
a. Two level directory structure.
b. Acyclic-graph directory structure.
- 8 Explain how banker's algorithm works for deadlock avoidance.

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Time: 2 hours**Max. Marks: 75**

Answer Any **Four** Questions
All Questions carries equal marks.

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- 1 a. Explain features of Distributed Operating System
- b. Explain different operations performed by the operating system
- 2 Explain how operating systems are used in a variety of computing environments.
- 3 a Explain about the Process Control Block
- b Discuss the Peterson's solution for the race condition with algorithm.
- 4 What is the average waiting time and average turn around times of all processes for FCFS, SJF algorithm?

Processes	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

- 5 a What is virtual memory? Discuss the benefits of virtual memory techniques.
- b Discuss the procedure for page fault in demand paging.
- 6 a 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
Determine how many page faults would occur for Optimal page replacement algorithm. Assume three frames are initially empty.
- b What are the disadvantages of contiguous memory allocation? Explain.
- 7 a Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO order 86,1470,913,1774,948,1509, 1022, 1750, 130 starting from current head position. What is the total distance that disk arm moves to satisfy all the pending request for FCFS and SSTF disk scheduling algorithm.
- b What are the objectives of file management system? Explain file system architecture
- 8 a Explain about deadlock conditions and Banker's algorithm in detail.
- b Write the principles of protection? And explain the access matrix in detail.

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III B.Tech I Semester Supplementary Examinations, February 2021**Operating Systems****(CSE&IT)**

Roll No									
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Time: 2 hours 30 min**Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 What are system calls? Illustrate them with an example? [15M]
- 2 With a neat Diagram, Discuss the Layered structure of operating system? [15M]
- 3 Consider the following set of processes, with the length of the CPU burst given in milliseconds: [15M]

Process	Burst Time	Priority
P1	15	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0. Draw Gantt chart that illustrate the execution of these processes using the non preemptive priority (a smaller priority number implies a higher priority) scheduling algorithm. What is the turnaround time and waiting time of each process?

- 4 Analyze any two Classical Synchronization Problems with clear examples. [15M]
- 5 Sketch the structure of page table. What is the purpose of paging the page tables? [15M]
- 6 Illustrate the following Page Replacement algorithms with clear examples. [15M]
(a)Second Chance(SC) (b)Not Recently used(NRU)
- 7 Describe various file allocation methods with their relative advantages and disadvantages. [15M]
- 8 How resource allocation graph is useful in Deadlock detection? Explain? [15M]

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(CSE & IT)

Roll No									
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Time: 2 hours 30 min**Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 Explain Different Operations Performed by the Operating Systems? [14M]
- 2 Define System Call? And Explain Briefly System calls with Examples. [14M]
- 3 Define Process? Explain about Process State Diagram with Example. [14M]
- 4 Define Semaphore? And Explain the Readers Writers Problem and its solution [14M]
using the Concept of Semaphore.
- 5 Define Paging? And Consider the following reference string for a memory with [14M]
three frames 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 Illustrate the FIFO page
replacement algorithm for the above string.
- 6 Explain LRU page replacement algorithm with a neat example [14M]
- 7 Describe Various File Allocation methods Briefly [14M]
- 8 Briefly explain about deadlock prevention methods with examples of each [14M]

R18

Code No: R18A0504

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, July/August 2021

Operating Systems

(CSE & IT)

Roll No									
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Time: 3 hours

Max. Marks: 70

Answer Any Five Questions

All Questions carries equal marks.

- 1 a. Explain about the components of modern computer system? **[7M]**
 b. What are three advantages and one disadvantage of multiprocessor systems? **[7M]**

- 2 a. Distinguish among following terminologies i) Multiprogramming systems ii) Multitasking Systems iii) Multiprocessor systems. **[7M]**
 b. Describe the actions taken by a kernel to context-switch between kernel-level threads. **[7M]**

- 3 Explain different types of CPU Schedulers.
 i. Preemptive and non preemptive scheduling **[5M]**
 ii. I/O bound and CPU bound **[5M]**
 iii. Scheduler and dispatcher **[4M]**

- 4 Five batch jobs A, B, C, D and E arrive at a computer center at almost at the same time. They have estimated running times of 10,6,2,4 and 8 minutes. Their priorities are 3,5,2,1 and 4 respectively, with 5 being the highest priority. For each of the following scheduling algorithm determine the turnaround time of each process and waiting time of each process. Ignore process switching overhead. Mention which algorithm results in minimal average waiting time. **[14M]**
 i) Round Robin
 ii) Priority scheduling
 iii) First come first served
 iv) Shortest job first.

For case i) Assume that system is multiprocessing, and each job gets its fair share of the CPU. (time quantum 2 minutes). For cases (ii), (iii) and (iv) assume that only one job runs at a time, until it finishes. All jobs are completely CPU bound.

- 5 Consider a swapping system in which memory consists of the following hole sizes in memory order: 12 KB, 4 KB, 24 KB, 15 KB, 9 KB, 7 KB, 10 KB, and 11 KB. Which hole is taken for successive segment requests of: (i) 14 KB (ii) 8 KB (iii) 5 KB for first fit, best fit, worst fit, and next fit approaches? **[14M]**

- 6** a. Describe the hardware implementation of a page table with translation Look-aside Buffer. [7M]
- b. What is virtual memory? Explain Suppose we have a demand paged memory. The page table is held in registers. it takes 8ms to service a page fault if an empty page is available or the replaced page is not modified, and 20ms if the replaced page is modified. memory access time is 100ns. Assume that the page to be replaced is modified 70% of the time. what is the maximum acceptable page fault rate for an effective access time of no more than 200ns? [7M]
- 7** Explain about the linear list and hash table data structures to implement a directory. [14M]
- 8** a. A system has 3 devices D1, D2 and D3 and 3 processes P1, P2, and P3. P1 is holding D1 and waiting for D3. P2 is holding D2 and waiting for D1. P3 is holding D3 and waiting for D2. Draw resource allocation graph and wait-for graph. Is the system in deadlock state or not? Explain. [7M]
- b. Is disk scheduling, other than FCFS scheduling, useful in a single-user environment? Justify your answer. [7M]
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III B.Tech I Semester Supplementary Examinations, July/August 2021**Operating Systems****(CSE&IT)**

Roll No									
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Time: 3 hours**Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 In a multiprogramming and time sharing environment several users share the system simultaneously. This situation can result in various security problems. Discuss these problems? [15M]
- 2 Explain various operating System Generations? [15M]
- 3
 - a. What are various issues to be considered in Multiple-Processor scheduling? [7M]
 - b. Explain about various states of process with neat diagram. [8M]
- 4 What are various operations performed on a process? Explain each one in detail considering operating systems examples? [15M]
- 5 Illustrate the following Page Replacement algorithms with clear examples. [15M]
FIFO (b)Optimal
- 6 Analyze the concept of Segmentation with paging and its use in OS Memory Management [15M]
- 7 Classify different types of files and list their extensions. [15M]
- 8 Consider the following snapshot of a system: [15M]

	Allocation	Max	Available
	-----	-----	-----
	A B C D	A B C D	A B C D
Po	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
p2	1 3 5 4	2 3 5 6	
p3	0 6 3 2	0 6 5 2	
p4	0 0 1 4	0 6 5 6	

Apply Banker's Algorithm and determine whether the system is in safe state or not?

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III B.Tech I Semester Supplementary Examinations, July/August 2021**Operating Systems****(CSE & IT)**

Roll No									
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Time: 3 hours**Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 State and Explain Various types of Computer Systems. [14M]
- 2 What is OS? Describe the different types of Operating Systems with the examples. [14M]
- 3 Define Scheduling? Explain any Two CPU Scheduling Algorithms with Examples. [14M]
- 4 Explain in detail about Inter Process Communication with examples. [14M]
- 5 Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. [14M]
Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementation of the LRU algorithm.
- 6 Explain Optimal Page Replacement Algorithm with Example. [14M]
- 7 Explain any four File access methods for information in a file with neat diagrams. [14M]
- 8 Define Deadlock? State and explain four conditions that are necessary for deadlocks to occur with neat example. [14M]

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(Autonomous Institution – UGC, Govt. of India)**III B.Tech I Semester Regular/supplementary Examinations, November 2018****Operating Systems**
(CSE&IT)

Roll No									
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Time: 3 hours**Max. Marks: 75****Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A (25 Marks)

- 1). a Define Operating System. List out the objectives of an operating system. [2M]
- b Define system calls. Explain the main purpose of an operating system [3M]
- c What is semaphore? [2M]
- d Describe different process states. [3M]
- e Write the difference between internal and external fragmentation [2M]
- f Write the first ,best fit memory allocation techniques [3M]
- g Define boot block. How it initiated from disk [2M]
- h What are the various attributes that are associated with an opened file [3M]
- i Describe the Safe, unsafe, and deadlock state spaces [2M]
- j List the goals and principles of protection [3M]

PART-B (50 MARKS)**SECTION-I**

- 2 Discuss about the evolution of operating system [10M]
OR
- 3 Explain the purpose of system calls and discuss the system calls related to process control and communication in brief [10M]

SECTION-II

- 4 Discuss any five process scheduling algorithms with examples [10M]

OR

- 5 a) Write the solution to Dining Philosophers problem using Monitors [5M]
- b) Explain the Round Robin scheduling algorithm with a suitable example [5M]

SECTION-III

- 6 Given page reference string: 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. Compare the number of page faults for LRU, FIFO and Optimal page replacement algorithm [10M]

OR

- 7(a) Discuss about paging with neat diagram [5M]
- (b) Explain the various structure of page table [5M]

SECTION-IV

8 a) Explain the three allocation methods in file system implementation. Illustrate with proper diagram [5M]

b) How to organize the mass storage? Explain [5M]

OR

9 Discuss various disk scheduling algorithm with examples. [10M]

SECTION-V

10 Consider the table given below for a system, find the need matrix and the safety sequence, using Banker's algorithm. [10M]

Resource – 3 types

A – (10 instances)

B – (5 instances)

C – (7 instances)

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
p0	0	1	0	7	5	3	3	3	2
p1	2	0	0	3	2	2			
p2	3	0	2	9	0	2			
p3	2	1	1	2	2	2			
p4	0	0	2	4	3	3			

OR

11 a) Discuss about Access Matrix [5M]

b) Write a note on domain of protection [5M]
