



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## COMPUTER SCIENCE AND ENGINEERING ASSIGNMENT

<b>Course Name</b>	: <b>Operating System</b>
<b>Course Code</b>	: <b>A50510</b>
<b>Class</b>	: III B. Tech I Semester
<b>Branch</b>	: Computer Science and Engineering
<b>Year</b>	: 2017 – 2018
<b>Course Faculty</b>	Mr. N V Krishna Rao, Associate Professor, CSE Mr. D Kishore Babu, Associate Professor, CSE Mr. K Chiranjeevi, Assistant Professor, CSE Mr. M Rakesh, Assistant Professor, CSE

### OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

### ASSIGNMENT – I & II

S. No.	Questions	Blooms Taxonomy Level	Course Outcome
<b>UNIT - I</b>			
1	<b>Explain</b> in detail the types of system calls provided by a typical operating system?	Understand	4
2	<b>Compare</b> Tightly coupled systems and loosely coupled systems.	Understand	1
3	<b>Define</b> Operating System Operations and Structures	Knowledge	1
4	<b>Compare</b> and contrast Multiprogramming, Multitasking and Multiprocessing.	Apply	1
5	a. <b>Define</b> an operating system? State and explain the basic functions or services of an operating system.	Understand	1
	b. <b>List</b> the differences between multiprogramming and Time-sharing systems.	Knowledge	
6	Briefly <b>Explain</b> various managements of operating systems and their responsibilities in detail?	Understand	1
7	<b>Explain</b> about context switching with necessary diagram?	Understand	1
8	<b>Define</b> the system structure of Modern Operating System?	Understand	1
9	Briefly <b>Compare</b> the different operating system structures?	Apply	1
10	<b>Compare</b> Batch operating system and Time Sharing operating system?	Apply	1

S. No.	Questions	Blooms Taxonomy Level	Course Outcome
11	<b>Explain</b> how do clustered systems differ from multiprocessor systems? What is required for two machines belonging to a cluster to cooperate to provide a highly available service?	Understand	1
12	<b>List</b> and discuss the various services provided by the operating system?	Knowledge	1
13	<b>Explain</b> the advantages and disadvantages of using the system calls interface for manipulating both files and devices?	Understand	4
14	<b>Distinguish</b> between the client-server and peer-to-peer models of distributed systems?	Understand	1
<b>UNIT – II</b>			
1	<b>Define</b> Monitor? Compare it with semaphore. Explain in detail a monitor with notify and broadcast using an example.	Knowledge	2
2	<b>Differentiate</b> I/O bound program and CPU bound program?	Understand	2
3	<b>Define</b> semaphore? Explain the application of semaphore.	Knowledge	2
4	<b>Give</b> short note about the following : a. Binary Semaphores. b. Bounded Waiting.		2
5	<b>List</b> out the various process states and briefly explain with a state diagram.	Knowledge	2
6	a. <b>Describe</b> process scheduling? Explain the various levels of scheduling. b. <b>Compare</b> and contrast pre-emptive and non-pre-emptive algorithm.	Understand  Analyze	2
7	<b>Explain</b> how the concurrent processes cooperate by sharing and by communication	Understand	2
8	<b>Discuss</b> about the actions taken by the kernel to context switch between the processes?	Understand	2
9	<b>List</b> five services provided by an operating system that are designed to make it more convenient for users to use the computer system. In what cases it would be impossible for user-level programs to provide these services? Explain.	Knowledge	2
10	<b>State</b> the purpose of short-term, medium-term and long term schedulers. Also discuss the differences among them.	Knowledge	2
11	<b>Describe</b> the following a. Virtual Machine b. Process state c. Process Control Block	Knowledge	2
12	<b>Define</b> Process? Explain different Process States?	Knowledge	2
13	<b>Describe</b> the following a. Race Condition b. Process Interaction	Knowledge	2
<b>UNIT – III</b>			
1	<b>Describe</b> the file system of UNIX?	Knowledge	7
2	<b>Compare</b> the main memory organization schemes of contiguous-memory allocation, segmentation, and paging with respect to the following issues: A. external fragmentation B. internal fragmentation C. ability to share code across processes	Apply	5
3	<b>Describe</b> Belady's anomalous behaviour of FIFO.	Understand	6
4	<b>Define</b> thrashing? Explain the different methods to avoid thrashing.	Knowledge	6
5	<b>Explain</b> about addresses binding for a user program and discuss multi	Understand	6

S. No.	Questions	Blooms Taxonomy Level	Course Outcome
	step processing of a user program?		
6	<b>State</b> and explain about Virtual memory concept with neat diagram.	Knowledge	6
7	<b>Explain</b> how double buffering improves the performance than a single buffer for I/O?	Understand	6
8	<b>Explain</b> the basic concepts of segmentation with neat diagrams?	Understand	7
9	<b>Differentiate</b> between logical I/O and device I/O?	Understand	7
10	<b>Differentiate</b> between internal and external fragmentation. Which one occurs in paging scheme?	Understand Understand	6
11	<b>Discuss</b> briefly about Swapping concept with necessary Examples.	Understand	7
12	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 <b>Calculate</b> the number of page faults would occur for the following replacement algorithms, assuming frame size is 4. Remember that frames are initially empty. (i)LRU replacement (ii)FIFO replacement (iii)Optimal replacement	Apply	6
13	<b>Explain</b> briefly about Paging with neat diagram.	Understand	6
14	<b>Discuss</b> LRU-Approximation page replacement?	Understand	6
<b>UNIT – IV</b>			
1	<b>Discuss</b> about a. Disk Management b. Swap -Space Management	Understand	7
2	<b>Describe</b> the following Directory Implementation methods: a. Linear List b. Hash Table	Knowledge	7
3	<b>Discuss</b> the Criteria for choosing file origination?	Understand	7
4	<b>Define</b> buffering, caching and spooling.	Knowledge	7
5	<b>Describe</b> indexed file, indexed sequential file organization?	Knowledge	7
6	<b>Explain</b> the following File concepts: a. File Attributes. b. File Operations. c. File Types. d. Internal File Structure.	Understand	7
7	a. <b>Discuss</b> about N- step- SCAN policy for disk scheduling. b. <b>Explain</b> how double buffering improves the performance than a single buffer for I/O.	Understand Understand	7
8	<b>List</b> and Explain three Blocking Methods?	Knowledge	7
9	<b>Explain</b> shortest Process Next scheduling with an example?	Understand	7
10	<b>Explain</b> the relationship between a pathname and a working directory?	Understand	7
11	<b>Discuss</b> about N-Step scan policy for disk scheduling?	Understand	7
12	<b>Discuss</b> in detail the performances issues of secondary storage management?	Understand	7
13	<b>Compare</b> and contrast chained allocation with indexed allocation technique of file allocation	Apply	7
14	<b>List</b> the various disk space allocation strategies. Explain clearly the contiguous allocation technique.	Knowledge	8
15	<b>Describe</b> briefly a. The methods of file accessing. b. Two level directory structure.	Knowledge	7
16	<b>Explain</b> about the protection strategies provided for files. a. Types of access b. Access control list (ACL)	Understand	8

	c. Three classifications-owner, group & universe		
	d. Other protection approaches-passwords		
	<b>UNIT – V</b>		
1	<b>Explain</b> the working of banker’s algorithm for deadlock avoidance with suitable examples.	Understand	9
2	a. <b>Explain</b> the critical section? Describe the different solution available to avoid race conditions?	Understand	9
	b. <b>Explain</b> about Mutual exclusion?		
3	<b>Explain</b> the Banker’s algorithm for deadlock avoidance.	Understand	9
	a. Deadlock avoidance definition		
	b. Data structures used		
	c. Safety algorithm		
	d. Resource request algorithm		
4	<b>Describe</b> the access matrix model used for protection.	Understand	11
5	<b>Relate</b> the terms race condition, atomic transaction, critical section and mutual exclusion.	Apply	9
6	<b>Describe</b> Resource-Allocation graph? Explain how resource graph can be used for detecting deadlocks.	Understand	9
7	<b>Discuss</b> deadlock detection in detail.	Understand	9
8	<b>Explain</b> briefly about resource allocation graph with examples.	Understand	9
9	<b>State</b> and explain the methods involved in recovery from deadlocks	Knowledge	9
10	<b>Explain</b> the conditions for the deadlock to occur? How can a deadlock be prevented?	Understand	9

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