

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Name	Distributed Operating System
Course Code	BCS004
Class	I M. Tech II Sem
Branch	Computer Science Engineering
Year	2017 - 2018
Team of Instructors	Mr. R.M.Noorullah, Associate Professor,

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.

PART – A (SHORT ANSWER QUESTIONS)

S. No	QUESTIONS	Blooms taxonomy level	Course outcome
	UNIT – I INTRODUCTION		
1.	What is distributed systems	Remember	1
2.	Define the distributed operating systems ?	Remember	1
3.	Write about the issues of distributed operating systems?	Understand	3
4.	Write about the layered protocols?	Understand	2
5.	State the client server model?.	Remember	2
6.	Draw the block diagram of layered protocol architecture?.	Understand	2
7.	State about the remote procedure calls.		2
8.	Write about the middleware and distributed operating systems	Remember	2
9.	Write short notes on ATM networks ?	Understand	2

S. No	QUESTIONS	Blooms taxonomy level	Course outcome
10.	Write short notes on multiprocessor time sharing systems	Remember	1
11.	What are the different forms of data types and how to test the data type in R? Give one example for each	Understand	2
12.	What do you mean by Distributed operating system?Write motivation factor of distributed operating system		
13.	Diffentiate between bus based multiprocessors and switched mutiprocessors	Remember	1
14.	How switched and bus based multicomputers working	Understand	2
15.	Write the disadvantage of distributed operating systems	Remember	1

S. No	Questions	Blooms Taxonomy Level	Course Outcome
	UNIT – I INTRODUCTION		
1.	Define distributed operating systems. What are the advantages and disadvantages of distributed systems ? discuss major design issues of distributed system.	Understand	1,2
2.	Explain ATM networks in detail What is RPC in distributed system? Explain	Remember	2,3
3.	What are the two types of transferences' of RPC? Explain the implementation of RPC mechanism.	Understand	1,2
4.	Explain the different types of call semantics used in RPC System	Apply	3
5.	Explain the architecture of distributed shared memory with the issues concerned in the design and implementation of distributed shared memory?	Apply	3
6.	Define distributed computing environment. Explain the distributed environment components	Understand	1
7.	Briefly explain the major technological ,and social factors that motivated the development of distributed computing systems. Further enlist the main advantages and disadvantages of distributed system over centralized ones	Apply	3
8.	What are the main differences between network operating systems and distributed operating systems and describe distributed system based on processor –pool-model and write merits.	Understand	3
9.	Why distributed system operating systems are difficult to design than operating systems for centralized time sharing system?	Understand	2
10.	Why is heterogeneity unavoidable in many distributed systems ? what are some of common types of incompatibilities encountered in heterogeneous distributed systems ? discuss the common issues with the designer of heterogenous distributed system must deal	Understand	2

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I INTRODUCTION		
1. I a c c	in distributed system each processor has its own a) local memory b) clock c) both (a) and (b) l) none of the mentioned	Apply	8
2. I e c	 f one site fails in distributed system a) the remaining sites can continue operating b) all the sites will stop working c) directly connected sites will stop working d) none of the mentioned 	Apply	9
3. 3 8 0	 B. Network operating system runs on a) server b) every system in the network c) both (a) and (b) d) none of the mentioned 	Apply	8
4. 8 a t c	 Which technique is based on compile-time program transformation for accessing remote data in a distributed-memory parallel system. a) cache coherence scheme b) computation migration c) remote procedure call d) message passing? 	Apply	9
5. I e c c	Logical extension of computation migration is a) process migration b) system migration c) thread migration d) data migration	Apply	8
6. F a t c	Processes on the remote systems are identified by a) host ID b) host name and identifier c) identifier d) process ID	Apply	9
7.	 Remote Procedure Calls are used : a) for communication between two processes remotely different from each other on the same system b) for communication between two processes on the same system c) for communication between two processes on separate systems d) none 	Apply	9
8.] a t c	To differentiate the many network services a system supports are used. a) Variables b) Sockets c) Ports d) Service names	Apply	8

9.	 3) RPC provides a(an) on the client side, a separate one for each remote procedure. a) stub b) identifier c) name d) process identifier 	Apply	9
10.	In operating system, each process has its own a) address space and global variables b) open files c) pending alarms, signals and signal handlers d) all of the mentioned	Apply	8

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – II		
1.	What is physical clock synchronization?	Understand	3
2.	Describe about the logical clocks ?	Understand	3
3.	Write short notes on Cristian's Algorithm?	Understand	3
4.	Explain about the Berkeley Algorithm	Understand	3
5.	Write two differences between centralized algorithm and distributed algorithm	Understand	3
6.	What is token ring algorithms?	Understand	3
7.	Show a comparison of three mutual exluision algorithm	Understand	3
8.	Write about the transaction primitives	Remember	3
9.	Describe the two-phase commit protocol	Remember	3
10.	Show the difference between distributed deadlock detection and prevention		

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – II MUTUAL EXCLUSION AND DE ADLOCK IN DISTDIBUTED (XOTENIO	
	MUTUAL EXCLUSION AND DEADLOCK IN DISTRIBUTED S	STEMS	
1.	Discuss any two algorithms for ensuring the mutual exclusion in distributed systems	Understand	3
2.	Discuss bully's algorithm for choosing co-coordinator process	Apply	3
3.	a)What is meant by synchronization ? justify its need for distributed systemsb) write an algorithm that decides whether a given set of clocks are synchronized or not what input parameters needed in your algorithm?	Understand	3
4.	Explain clock synchronization algorithms i) centralized algorithms ii) distributed algorithms and compare merits and demerits both i) and ii)	Apply	3

5.	 Explain distributed algorithms for deadlock detection i) WFG- based distributed algorithm ii) Probe based distributed algorithm 	Apply	3
6.	What are deadlocks ?Discuss Chandy-Misra-Hass distributed deadlock detection algorithm?	Remember	2
7.	Explain about the distributed deadlock prevention algorithm with example	Apply	3
8.	Write about the two phase locking and optimistic concurrency control with time stamps?	Remember	2
9.	Describe atomic transactions and transaction primitives in distributed systems	Apply	3
10.	a)What is happened before relation of event ordering ? explain with space time diagram?b) Why do we use election algorithm? Explain bully algorithm with an example?	Apply	3

S. No	Question	Blooms Taxonomy Level	Course Outcome	
	UNIT – II MUTUAL EXCLUSION AND DEADLOCK IN DISTRIBUTED SYSTEMS			
1.	Name atleast three sources of delay that can be introduced between WWV broadcasting the time and the processors in a distributed system setting their internal clocks ?	Apply	9	
2.	In the approach to cache consistency using leases, is it really essential that the clocks are synchronized ? if not, what is it that is required ?	Apply	8	
3.	Suppose that detect the demise of the coordinator simultaneously and both decide to hold an election using bully algorithm. What happens?	Understand	9	
4.	For some ultra sensitive applications it is conceivable that stable storage implemented with disks is not reliable enough . can the idea be extended to three disks ?if so how would it work ? If not why not ?	Apply	8	
5.	In write head log, both the old and new values are stored in the log entries is it not adequate just to store new value ? what good the old one ?	Apply	9	
6.	Give full agothm for the wether an attempt lock a file should to succeed or fail .consider both the read and write locks ,and the possibility and that the file.was unlocked , read locked , or write locked.	Apply	8	
7	Systems that use locking for concurrency control usually distinguish read locks from write locks.What should happen idf a process has already acquired a read lock and now wants to change it into a write locks? What about changing a write lock into a read lock?	Apply	9	

	A process with transaction timestamp 50 needs a resource aheld by aprocess with transition timestamp 100. What happens in:	Apply	9
8.	a) Wait- die?b) Would- wait?		

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	PROCESSES AND PROCESSORS		
1.	State about the treads and lightweight processess	Remember	3, 4
2.	List three ways to construct a server?	Understand	4
3.	State the design issues for Threads package ?	Understand	3
4.	Explain about the mutexes and condition variables .	Remember	3
5.	Write short notes on creation of thread when message arrives?	Remember	3
6.	Give few points about disk usage on workstations ?	Remember	4
7.	Draw a diagram of a registry – based algorithm for finding and using idle workstations	Remember	4
8.	Show the design issues for processor allocation algorithms	Remember	4
9.	What is meant by hierarchical file systems and what is meant by naming transferency?	Remember	3
10.	List out the four ways of dealing with the shared files in distributed systems	Understand	3

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – III PROCESSES AND PROCESSORS		
1.	a).Explain the desirable features of a good global scheduling algorithm b) Explain the different issues in designing Load-Balancing algorithm	Apply	3
2.	a) Explain the advantages of process migrationb) Explain the design issues in file caching schemes	Apply	3
3.	Explain three different mechanisms used for address space transfer during process migration? and describe the advantages of process migration?	Apply	3
4.	Explain issues in designing thread packages &Explain file sharing semantics with figures	Apply	4
5.	What do you mean by file caching? Describe different key decisions to be addressed in a file- caching scheme for distributed file system.	Apply	4
6.	Give a brief account on Threads in distributed systems?	Apply	4

7.	Describe the design issues for threads packages in distributed systems	Apply	3
8.	Explain in detail about system models	Apply	4
9.	Describe the design issues for processor allocation algorithm	Apply	4
10.	Explain the scheduling comcept in distributed systems	Apply	4

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome	
	UNIT – III PROCESSES AND PROCESSORS			
1.	Would the scheme of bershad et al. to make local RPCs go further also work in a system with only one thread per processes? How about with peregrime?	Apply	9	
2.	Imagine that a process is running remotely on previously idle workstation, which, like all the workstations, is disless.for each of the following UNIX System calls, tell whether it has to be forwarded back to the home machine. a)READ b) IOCTL c) GETPID	Apply	6	
3.	The-updown algorithm is a centralized algorithm design to allocate processors fairely. Invent a centralized algorithm whose goal is not fairness but distributing the load uniformely	Apply	6	
4.	Why can file caches use LRU whereas virtual memory paging algorithms cannot ? back up your arguments with approximate figures.	Apply	7	
5.	When file systems replicate files, they do not normally replicate all files. Give an example of kind of file that is not worth replicating.	Apply	9	

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – IV		
	DISTRIBUTED SHARED MEMORY		
1.	Draw diagrams of single chip computer and hypothetical shared memory the basic structure of neural network.?	Remember	3, 4
2.	Define Memnet? What is ring based multiprocessors?	Understand	4
3.	Explain the three states of each block?	Understand	3
4.	What is mean by NUMA Multiprocessors?	Remember	3
5.	Draw the spectrum of shared memory machines ?	Remember	3
6.	Compare and contrast the six kinds of shared memory systems ?	Remember	4
7.	What is mean by PRAM Consistency and Processor Consistency and weak consistency	Remember	4
8.	Explain about the page replacement concept?	Remember	4

9.	Define synchronization in distributed operating systems	Remember	3
10.	Show the diagram of partial broadcasting of tuples and templates?	Understand	3

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – IV DISTRIBUTED SHARED MEMORY		
1.	Explain the functionality of cache ownership protocol with an example ?	Apply	3
2.	Describe the NUMA multiprocessors withan example ?	Apply	3
3.	Explain in detail about the NUMA Algorithms	Apply	3
4.	Explain the different types consistency models	Apply	4
5.	Describe various page –based distributed shared memory	Apply	4
6.	Describe the DSM using two system such as Munin and Midway?	Apply	4
7.	Explain about the object-based distributed shared memory?	Apply	4
8.	Describe about the directories in shared memory?	Apply	4
9.	Explain about how to find the ownership shared memory?	Apply	4
10.	Explain about the granularity and how to achieve sequential constistency	Apply	4

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – IV DISTRIBUTED SHARED MEMORY			
1.	A Dash system has b bytes of memory divided over n clusters. Each cluster has processors in it. The cache block size is c bytes. Give a formula for the total amou of memory devoted to directories (excluding the two state bits per directory entry	nt Apply	6,9
2.	During the discussion of memory consistency models ,we often referred to the contrast between the softwareand memory.why is such a contrast needed?	Apply	7,8
3.	Suppose that two variables , A and B are located , by accident, on the same page a page –based DSM system. However, both of them are unshared variables . is fa sharing possible?	of llse Apply	8,9

4.	What happen if a Munin process modifies a shared variable outside a critical region?	Apply	8,9
5.	When Linda is implemented by replicating tuples on multiple machines , a protocol is needed for deleting tuples .Give an example of aprotocol that does not yield races when two processes try to delete the same tuple at the same time.	Apply	8,9

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy	Course Outcome
	UNIT – V		
	CASE STUDY 2:MACH		
1.	State the goals of Mach?	Remember	3, 4
2.	Draw the A Mach process?	Understand	4
3.	Write down the selected process management calls in Mach	Understand	3
4.	What is mean by virtual memory? Explain briefly?	Remember	3
5.	State the selected message types from the kernel to the external memory	Remember	3
	manager		
6.	Show the Mach port ?	Remember	4
7.	List out the selected port management calls in Mach?.	Remember	4
8.	Show the Mach message format?.	Remember	4
9.	What is trampoline mechanism?	Remember	3
10.	Show the intermachine communication in Mach proceeds in five steps?	Understand	3

PART – B (LONG ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – V CASE STUDY 2:MACH		
1.	MACH supports the concept of a processor set. On what class of machines does this concepts make most sense? What is it used for?	Apply	3
2.	Discuss how memory is managed in MACH?	Apply	3
3.	Briefly discuss the following a) Unit emulation in MACH b) Implementation C threads in MACH	Apply	3
4.	Explain the process management in MACH?	Apply	4
5.	Describe the distributed shared memory concept in MACH?	Apply	4
6.	Describe selected port management calls in MACH?	Apply	4
7.	How does the Network message server works explain in detail ?	Apply	4
8.	Explain the A complex message field descriptor?	Apply	4
9.	Describe the below two situations a) Situation just before the capability is sent b) Situation after it has arrived	Apply	4
10.	Explain the Mach message formats in sending and receiving sites ?	Apply	4

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – V CASE STUDY 2:MACH			
1.	A Mach thread creates two new threads as its children , A and B. Thread A does a detach call ; B does not. Both threads exit and and the parent does a join. what happens ?	apply	7
2.	Mach supports supports three inheritance attributes for regions of virtual address space. Which ones are needed to make Unix Fork Works Correctly?	Apply	5
3.	why is the page replacement algorithm run in the kernel instead of in an external memory manager?	Apply	9
4.	Can two processes simultaneously have RECEIVE capabilities for the same port? How about SEND capabilities?	Apply	9
5.	Does a process know that a port it is reading from is actually a port set ? does it matter?	apply	8

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