

MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Model Question Paper Fourth Semester BE Degree Examination Operating Systems

Time: 3 Hours Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module. 2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1										L	C	
a	Describe the Operating System from the user view and system view.									L2	CO1	
b	•		ne Dual m	ode o	peration, l	Multipr	ogramr	ning and	8	L3	CO1	
С	1										CO1	
OR												
a						nple a	nd exp	olain the	6	L2	CO1	
b		esign the layered approach and the modular approach operating system									CO1	
С	Explain with a neat of benefits.	6	L2	CO1								
Module- 2												
a	Illustrate with a neat diagram the process with its state and a queuing diagram to										CO2	
b				operat	ing systen	n and e	explain.	Write a	8	L3	CO2	
С	and average waiting	time for the	e following	g set c	of processe	es using			6	L3	CO2	
I.				OR	I		ı					
a	Discuss various mod kernel thread.	lels of mult	ithreading	and t	he relation	nship b	etween	user and	6	L2	CO2	
b	Classify various methods for logical implementation of message - passing								8	L3	CO2	
С	pre-emptive priority Also calculate average largest priority proces Process P1 P2 P3	scheduling ge waiting ess has high Arriv 0 3 3	algorithr time and a er priority	ns and average) Burs 6 5	l Round rege turnarou	obin (quantum Priori 4 2 6	uantum e. (Con	a = 4ms).	6	L3	CO2	
	a b c	b Classify the technique Multitasking systems c Demonstrate the operatorage management a Demonstrate the use relationship between between between structure and classify content of the c	a Describe the Operating System b Classify the technique used in the Multitasking systems. c Demonstrate the operating systems storage management. a Demonstrate the usage of system systems and personal process of structure and classify the technic control process migration. b Design the layered approach structure and classify the technic control process migration. b Develop a tree of processes for program in C forking a separate control process of program in C forking a separate control process of pr	a Describe the Operating System from the to Classify the technique used in the Dual m Multitasking systems. c Demonstrate the operating system's responstorage management. a Demonstrate the usage of system call relationship between API-System call interest in the structure and classify the techniques of both benefits. Mo a Illustrate with a neat diagram the concept of benefits. Mo a Illustrate with a neat diagram the process represent process migration. b Develop a tree of processes for Solaris of program in C forking a separate process. c Draw the Gantt chart and find out the cortain and average waiting time for the following Process Arrival Tellong Process Arrival Time Process Arrival	a Describe the Operating System from the user vibral Classify the technique used in the Dual mode of Multitasking systems. c Demonstrate the operating system's responsibility storage management. OR a Demonstrate the usage of system call with relationship between API-System call interface-between API-System call interface-between action of both. c Design the layered approach and the module structure and classify the techniques of both. c Explain with a neat diagram the concept of Virture benefits. Module- a Illustrate with a neat diagram the process with interpresent process migration. b Develop a tree of processes for Solaris operate program in C forking a separate process. c Draw the Gantt chart and find out the completic and average waiting time for the following set of Process Arrival Time P1 0 P2 2 P3 4 P4 5 OR a Discuss various models of multithreading and the kernel thread. b Classify various methods for logical implements systems. c Draw the Gantt chart to interpret the execution pre-emptive priority scheduling algorithms and Also calculate average waiting time and average largest priority process has higher priority) Process Arrival Time Burs P1 0 P2 3 P3 3 S 5 P3 3 S 5 P3 3 S 5 P3 3 S 6	a Describe the Operating System from the user view and sy b Classify the technique used in the Dual mode operation, Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t storage management. OR a Demonstrate the usage of system call with an exar relationship between API-System call interface-OS. b Design the layered approach and the modular approstructure and classify the techniques of both. c Explain with a neat diagram the concept of Virtual machin benefits. Module- 2 a Illustrate with a neat diagram the process with its state an represent process migration. b Develop a tree of processes for Solaris operating system program in C forking a separate process. c Draw the Gantt chart and find out the completion time, at and average waiting time for the following set of processes. Process Arrival Time Burst Time P1 0 6 P2 2 3 3 P4 5 5 OR a Discuss various models of multithreading and the relation kernel thread. b Classify various methods for logical implementation systems. c Draw the Gantt chart to interpret the execution of the following set or processed and average turnarous largest priority process has higher priority) Process Arrival Time Burst Time Process Arrival Time Process Arrival Time	a Describe the Operating System from the user view and system v b Classify the technique used in the Dual mode operation, Multipre Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t process storage management. OR a Demonstrate the usage of system call with an example a relationship between API-System call interface-OS. b Design the layered approach and the modular approach of structure and classify the techniques of both. c Explain with a neat diagram the concept of Virtual machine mode benefits. Module- 2 a Illustrate with a neat diagram the process with its state and a querepresent process migration. b Develop a tree of processes for Solaris operating system and oprogram in C forking a separate process. c Draw the Gantt chart and find out the completion time, average and average waiting time for the following set of processes using Process Arrival Time Burst Time P1 0 6 P2 2 3 5 5 OR a Discuss various models of multithreading and the relationship be kernel thread. b Classify various methods for logical implementation of messystems. c Draw the Gantt chart to interpret the execution of the following pre-emptive priority scheduling algorithms and Round robin (of Also calculate average waiting time and average turnaround time largest priority process Arrival Time Burst Time Priority Process A	a Describe the Operating System from the user view and system view. b Classify the technique used in the Dual mode operation, Multiprogramm Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t process, memoratorage management. OR a Demonstrate the usage of system call with an example and exprelationship between API-System call interface-OS. b Design the layered approach and the modular approach operating structure and classify the techniques of both. c Explain with a neat diagram the concept of Virtual machine model with benefits. Module- 2 a Illustrate with a neat diagram the process with its state and a queuing direpresent process migration. b Develop a tree of processes for Solaris operating system and explain. program in C forking a separate process. c Draw the Gantt chart and find out the completion time, average turnaro and average waiting time for the following set of processes using FCFS, Process Arrival Time Burst Time Pl 0 6 P2 2 3 3 P3 4 3 3 5 5 2 P3 P3 4 5 5 2 P3 93 3 5 2 P3 5 2 P3 5 5 2 P3 93 5 5 2 P3 94 94 95 95 95 95 95 95 95 95 95 95 95 95 95	a Describe the Operating System from the user view and system view. b Classify the technique used in the Dual mode operation, Multiprogramming and Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t process, memory and storage management. OR a Demonstrate the usage of system call with an example and explain the relationship between API-System call interface-OS. b Design the layered approach and the modular approach operating system structure and classify the techniques of both. c Explain with a neat diagram the concept of Virtual machine model with its benefits. Module- 2 a Illustrate with a neat diagram the process with its state and a queuing diagram to represent process migration. b Develop a tree of processes for Solaris operating system and explain. Write a program in C forking a separate process. C Draw the Gantt chart and find out the completion time, average turnaround time and average waiting time for the following set of processes using FCFS, SRTF. Process Arrival Time Burst Time Pl 0 6 P2 2 3 P3 4 3 P4 5 5 OR a Discuss various models of multithreading and the relationship between user and kernel thread. b Classify various methods for logical implementation of message - passing systems. c Draw the Gantt chart to interpret the execution of the following processes using pre-emptive priority scheduling algorithms and Round robin (quantum = 4ms). Also calculate average waiting time and average turnaround time. (Consider the largest priority process has higher priority) Process Arrival Time Burst Time Priority	a Describe the Operating System from the user view and system view. b Classify the technique used in the Dual mode operation, Multiprogramming and Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t process, memory and storage management. 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Also calculate average waiting time and average turnaround time. (Consider the largest priority process has higher priority) Process Arrival Time Burst Time Priority P1 0 6 4 4 P2 3 5 5 2 P3 3 5 2 P3 3 5 2 P3 3 5 2 P3 3 6	a Describe the Operating System from the user view and system view. b Classify the technique used in the Dual mode operation, Multiprogramming and Multitasking systems. c Demonstrate the operating system's responsibilities w.r.t process, memory and storage management. OR a Demonstrate the usage of system call with an example and explain the relationship between API-System call interface-OS. b Design the layered approach and the modular approach operating system structure and classify the techniques of both. c Explain with a neat diagram the concept of Virtual machine model with its benefits. 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								Mo	dule	- 3					
	a	Illustrate t the critical					probl	em ar	nd a o	classi	c soft	ware-based solution to	6	L2	CO3
	b	Describe Semaphore and explain its implementation with block and wakeup operation												L2	CO3
	c	Apply the Banker's resource-request algorithm & identify the safety sequence of processes execution for below snapshot.													
Q5		Process P0 P1 P2 P3 P4	All A 0 2 3 2 0	B 1 0 0 1 0	on C 0 0 2 1 2	Max A 7 3 9 2 4	B 5 2 0 2 3	C 3 2 2 2 3	A 3	ilable B 3	C 2	If P1 request (1,0,2) & in this state P4 request (3,3,0) then identify the safety of the system.	8	L3	CO3
									OR				1	ı	
	a	construct t	he g	graph	to sho	ow wi	ith a c	deadlo	ck ar	nd wit	h a cy	ce-allocation graph and ycle but no deadlock.	6	L2	CO3
	b											over from deadlock.	6	L3	CO3
Q6	С	For the following resource-allocation state, prove that system is not in deadlock state and examine if P2 makes one additional request for instance of resource type C and justify your answer. Process Allocation Request Available A B C A B C													
		P0 P1 P2 P3 P4	0 2 3 2 0	1 0 0 1	0 0 3 1 2	0 2 0 1 0	0 0 0 0 0	0 2 0 0 2	0	0	0		8	L3	CO3
									dule						
	a	Explain the support of paging hardware in handling paging scheme. Given pages in logical memory each of 4 bytes in size and physical memory of 3 bytes (8 pages) and index to page table is 0-5, 1-6, 2-1, 3-2, show mapping with appropriate entries.										physical memory of 32	7	L3	CO4
Q7	b	Construct a paging hardware with TLB for a simple paging system and explain the process. Find out EAT for a 80% hit ratio, 20ns to search in TLB and 100ns to access memory.									arch in TLB and 100ns	7	L3	CO4	
	c				_			-	_			memory management s with few example.	6	L3	CO4
									OR				1		
	a	page fault	and	comp	oute E	EAT f	or de	mand	page.			the steps in handling a	7	L3	CO4
Q8	b	memory w page repla	ith (3 fran ent a	nes. F Igoritl	ind th	ne nu	mber	of pa	ge faı	ılts us	3 2 1 2 0 1 7 0 1 for a sing LRU and Optimal	7	L3	CO4
	c		dat	abase	-1271	kb but	the f			_		ss needs 10kb, and an y. How do you allocate	6	L3	CO4



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	Module – 5							
	a	Mention various file operations and explain different file access methods.	6	L2	CO5			
Q9	b	Identify the mechanism of a linked allocation that solves the contiguous allocation problem during file allocation mechanism.	8	L3	CO5			
С		Describe Tree structured directories and Acyclic graph directories with neat diagram	6	L2	CO5			
	OR							
	a	Explain with a neat diagram the structure of a magnetic disk.	6	L2	CO5			
Q10	b	Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order. Calculate the total head movement required to satisfy all the requests assuming current head position is at cylinder 53 using FCFS, SSTF, SCAN and C-LOOK.	8	L3	CO5			
	c	Explain Bad blocks and swap space management in brief.	6	L2	CO5			

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