CBCS SCHEME - Make-Up Exam

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BCS303

Third Semester B.E./B.Tech. Degree Examination, June/July 2025
Operating Systems

Time: 3 hrs. Max. Marks: 100

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

		Module – 1	M	L	C
Q.1	a.	With neat diagram, Explain abstract view of the components of a computer system.	6	L3	CO1
	b.	With neat diagram, explain virtual, non virtual and VM ware architecture.	8	L3	CO1
	c.	Explain with neat diagram Dual-Mode operation.	6	L3	CO1
		OR			
Q.2	a.	Explain types of system calls provided by operating system.	6	L3	CO1
	b.	Explain with neat diagram simple structure of MS-DOS layer structure and unix system structure.	8	L3	CO1
	c.	Explain operating-system services.	6	L3	CO1
		Module – 2			
Q.3	a.	Explain process state with diagram.	5	L2	CO2
	b.	What do you mean by interprocess communication? Explain two model of interprocess communication.	9	L2	CO2
	c.	What are three types of multithreading models? Explain.	6	L2	CO2
		OR			
Q.4	a.	What do you mean by thread libraries? Discuss threading issues.	5	L2	CO2
	b.	Consider the following set of four process with length of CPU burst given in MS: Process / Burst time P_1 / 24 P_2 / 3 P_3 / 3 Compute the waiting time and average turn around time for the above process using FCFS scheduling algorithm.	10	L2	CO2
	c.	With diagram explain SMT architecture.	5	L2	CO2
		Module – 3			
Q.5	a.	What is critical section problem? Explain Peterson's solution and synchronization hardware solution for critical section problem.	10	L3	CO3
	b.	Write a code for readers-writers process.	6	L3	CO3
	c.	Discuss the structure of philosopher.	4	L3	CO3

OR

Q.6	**a.**	What are the four necessary condition for deadlock occurrence?	**4**	**L3**	**CO3**
	b.	Explain with neat diagram resource-allocation graph for deadlock avoidance.	**6**	**L3**	**CO3**
	c.	Consider the following snapshot of the system: Determine whether the system is safe using Banker's algorithm. If the request for P_1 arrives for (1, 0, 2) can the request be granted immediately.	**10**	**L3**	**CO4**

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Module – 4

Q.7	**a.**	Explain the following with respect to dynamic storage allocation: i) First fit ii) Best fit iii) Worst fit	**3**	**L3**	**CO4**
	b.	What is Paging? Explain with neat diagram paging hardware and paging model of logical and physical memory.	**10**	**L3**	**CO4**
	c.	With neat diagram, explain segmentation hardware.	**7**	**L3**	**CO4**

OR

Q.8	**a.**	With neat diagram, explain demand paging system.	**6**	**L3**	**CO4**
	b.	Consider the page 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 3 frames. Determine the number of page faults using FiFO, optimal and LRU replacement algorithms. Which algorithm is most efficient?	**9**	**L3**	**CO1**
	c.	Write a note on copy_on_write technique.	**5**	**L3**	**CO1**

Module – 5

Q.9	**a.**	Explain bit vector and linked free-space list on disc.	**6**	**L3**	**CO5** **CO6**
	b.	Explain with neat diagram contiguous allocation and indexed allocation.	**8**	**L3**	**CO5** **CO6**
	c.	With neat diagram single level and two level directory structure.	**6**	**L3**	**CO5** **CO6**

OR

Q.10	**a.**	Discuss network attached storage.	**5**	**L3**	**CO5** **CO6**
	b.	A disk drive has 200 cylinders 0 to 199. Head starts at 53 to serve the request queue: 98, 183, 37, 122, 14, 124, 65, 67. Draw disk head schedule diagram and explain for FCFS, SSTF, C-SCAN and C-LOCK.	**10**	**L3**	**CO5** **CO6**
	c.	Explain the concept of access matrix.	**5**	**L3**	**CO5** **CO6**

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