CBCS SCHEME

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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.	Define operating system. Briefly explain what operating system do.	06	L1	CO1
	b.	What is caching? List and explain performance of various levels of storage.	08	L1	CO1
	c.	What are the different special purpose system ? List them and explain each in brief.	06	L1	CO1
		OR			
Q.2	a.	Explain different operating system services which are helpful to the user.	06	L2	CO1
	b.	Define system calls. Explain with example how system calls are used.	08	L1	CO1
	c.	Discuss in detail about Operating System structure.	06	L2	CO1
		Module – 2			
Q.3	a.	Define process. Explain with a neat diagram of process state.	08	L1	CO2
	b.	Describe the difference among short term, medium term and long term scheduling.	06	L3	CO2
	c.	Differentiate the advantages and disadvantages of synchronous and asynchronous communication	06	L3	CO2
		OR			
Q.4	a.	Consider the following set of process, with the length of the CPU burst given in milliseconds: Process / Burst Time / Priority P1 / 10 / 3 P2 / 1 / 1 P3 / 2 / 3 P4 / 1 / 4 P5 / 5 / 2 i) Draw the Gantt Charts for: FCFS, SJF, non preemptive priority scheduling algorithms and RR (quantum = 1) ii) Calculate turnaround time and waiting time of each of process for the scheduling algorithms in part a.	08	L3	CO2
	b.	Explain with example of single threaded and multi threaded process.	06	L2	CO2
	c.	Explain with a neat diagrams of multithreading models.	06	L2	CO2
		Module – 3			
Q.5	a.	Define semaphores. Explain mutual exclusion implementation with semaphores.	10	L1	CO3
	b.	What is a deadlock? Explain the situation of the dining philosophers problem.	10	L1	CO3

OR

Q.6	**a.**	Explain necessary conditions of deadlock and what are methods used for handling deadlocks.	**10**	**L2**	**CO3**
	b.	Consider the following snapshot of a system: Answer the following questions using Bankers algorithm : i) What is the content of the matrix Need ? ii) Is the system in safe state? iii) If a request from process P1 arrives for (0,4,2,0) can the request be granted immediately?	**10**	**L3**	**CO3**

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	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	

Module – 4

Q.7	**a.**	Discuss the following : First fit, Best fit and worst fit.	**06**	**L1**	**CO4**
	b.	Explain with a neat diagram paging for a 32 – bytes memory with 4 – byte pages.	**08**	**L2**	**CO4**
	c.	Explain with a neat diagram segmentation Hardware.	**06**	**L2**	**CO4**

OR

Q.8	**a.**	Explain Demand paging with a neat diagram.	**06**	**L2**	**CO4**
	b.	How many page faults occur for the following reference string with three page frames. Using FIFO, optional and LRU algorithms. (7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1)	**08**	**L2**	**CO4**
	c.	Explain Thrashing with a neat diagram.	**06**	**L1**	**CO4**

Module – 5

Q.9	**a.**	Explain different allocation methods of file systems.	**08**	**L2**	**CO5**
	b.	With a neat diagram Explain File system mounting?	**06**	**L1**	**CO5**
	c.	Define the file attributes, List different file operations and explain each in brief.	**06**	**L1**	**CO5**

OR

Q.10	**a.**	Suppose that a disk drives has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder No. 43 and the previous request was at cylinder 125. The queue of pending requests in FIFO order is : 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current Lead position, what is the total distance (in cylinders)that the disk arm moves to satisfy all the pending requests for each of the following disk – scheduling algorithms? a) FCFS b) SSTF c) SCAN d) C - SCAN	**08**	**L3**	**CO5**
	b.	List and explain different goals and protection of an operating system.	**06**	**L2**	**CO6**
	c.	Discuss different file access methods	**06**	**L2**	**CO5**

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