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UPES
End Semester Examination, May 2023

Course: Operating System Program: MCA Course Code: CSEG7016	Semester: II Time : 03 hrs. Max. Marks: 100
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Instructions: Attempt all questions.

SECTION A
(5Qx4M=20Marks)

S. No.	Question	Marks	CO
Q 1	Define System Call. List out any four Process Control System Calls	2+2	CO1
Q 2	Explain Semaphore. Mention its properties.	2+2	CO2
Q 3	Define File. Describe the attributes of a file	2+2	CO4
Q 4	Mention the objectives and functions of an operating system.	2+2	CO1
Q.5	Define deadlock. Explain schemes used in operating system to handle deadlocks.	2+2	CO5

SECTION B
(4Qx10M= 40 Marks)

Q 1	Find the output of following code? <pre> #include <stdio.h> #include <unistd.h> int main() { if (fork()) { if (!fork()) { fork(); printf("1 "); } else { printf("2 "); } } else { printf("3 "); } } </pre>	10	CO1
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	<pre>printf("4 "); return 0; }</pre>		
Q 2	<p>Consider three processes (process id 0, 1, 2 respectively) with compute time bursts 2, 4 and 8 time units. All processes arrive at time zero. Consider the longest remaining time first (LRTF) scheduling algorithm. In LRTF ties are broken by giving priority to the process with the lowest process id. Calculate average turn around time?</p>	10	CO2
Q 3	<p>Consider the virtual page reference string 1, 2, 3, 2, 4, 1, 3, 2, 4, 1 On a demand paged virtual memory system running on a computer system that main memory size of 3 pages frames which are initially empty. Compute number of page faults under the LRU, FIFO page replacements policy.</p>	5+5	CO3
Q 4	<p>Explain the Bounded-Buffer problem with solution.</p> <p style="text-align: center;">OR</p> <p>I- Explain scheduler? List and describe different types of schedulers.</p> <p>II- Write down the difference between User Level Threads and Kernel Level Threads</p>	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 1	<p>A- Let the page fault service time be 10ms in a computer with average memory access time being 20ns. If one page fault is generated for every 10^6 memory accesses. Calculate the effective access time for the memory.</p> <p>B- Explain various types of memory Allocation techniques with advantages and disadvantages with example.</p>	10+10	CO5
Q 2	<p>A- Why is rotational latency usually not considered in disk scheduling? How would you modify SSTF, SCAN, and C-SCAN to include latency Optimization.</p> <p>B- Some systems automatically delete all user les when a user logs off or a job terminates, unless the user explicitly requests that they be kept. Other systems keep all les unless the user explicitly deletes them. Discuss the relative merits of each approach.</p> <p style="text-align: center;">OR</p> <p>A- Assume that you have a page-reference string for a process with m frames (initially all empty). The page-reference string has</p>	10+10	CO4

	<p>length p, and n distinct page numbers occur in it. Answer these questions for any page-replacement algorithms:</p> <ul style="list-style-type: none">a. What is a lower bound on the number of page faults?b. What is an upper bound on the number of page faults <p>B- Consider a system in which a program can be separated into two parts: code and data. The CPU knows whether it wants an instruction (instruction fetch) or data (data fetch or store). Therefore, two base –limit register pairs are provided: one for instructions and one for data. The instruction base –limit register pair is automatically read-only, so programs can be shared among different users. Discuss the advantages and disadvantages of this scheme.</p>		
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