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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 19EC5PE2OS **Max Marks: 100**
Course: Operating System **Date: 07.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1	a)	Elaborate on key concepts of the five classes of operating systems.	**10**
	b)	Analyse the operating principles of multiprogramming OS and identify the architectural support needed for its implementation.	**10**

OR

2	a)	Illuminate on round-robin scheduling with time-slicing. Consider two programs P1 and P2 to be executed in a multiprogramming system in round-robin scheduling with time-slicing. P1 has 15ms CPU burst and 100ms I/O burst, whereas P2 has 30ms CPU burst and 60ms I/O burst in every periodic instant. Show operation of the processes in a time-sharing system using a time slice of 10 ms and also show the scheduling list and scheduling decisions of the kernel, assuming scheduling overhead to be negligible.	**10**
	b)	Describe the Structure of a kernel-based OS and Identify the functions, services offered by a kernel-based OS.	**10**

UNIT - II

3	a)	Relate programs and process.	**04**
	b)	List the benefits of child processes.	**06**
	c)	Discuss the fundamental functions of the kernel for controlling processes.	**10**

UNIT - III

4	a)	What is a semaphore? List out the uses of a semaphore in implementing concurrency.	**10**
	b)	Discuss Least Completed Next (LCN) and Shortest Time to Go (STG) scheduling policies with example.	**10**

UNIT - IV

5	a)	Elaborate on heap management and list the kernel functions for reuse of memory.	**10**

b) Discuss three techniques used to perform memory allocation by using a free list **10**

OR

6 a) Explain contiguous and non-contiguous memory allocation and compare them. **10**

b) Consider the following page reference and reference time strings for a process: **10**
Page reference string 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5, . . .
Reference time string *t*1, *t*2, *t*3, *t*4, *t*5, *t*6, *t*7, *t*8, *t*9, *t*10, *t*11, *t*12, *t*13, . . .
Show operation of the FIFO and LRU page replacement policies for the given page reference string with page length equal to 3 and 4.

UNIT - V

7 a) Explain device drivers and illustrate how device drivers are used by the physical input-output control system (IOCS) **10**

b) Illustrate the file processing arrangement used in Windows operating system. **10**

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