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 & Telecommunication Engineering Duration: 3 hrs.

Course Code: 19ET5PE2OS 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.

UNIT - I

1. a) Differentiate between the logical and physical view of a program 'P' of an OS. **06**

   b) Consider a LAN network setup with a central server system on which the OS is setup. For this scenario illustrate the common tasks performed by OS. **08**

   c) Justify that the time slicing algorithm prevents the monopolization of CPU by a program in a time-sharing OS. **06**

UNIT - II

2. a) Define threads and analyse with relevant diagram **06**

   b) Construct the process state transition for a time sharing with time slice round robin scheduler system with two processes P1 and P2 with a time slice of 10 msec. P1 has a CPU burst of 15 msec and I/O of 100 msec and P2 has a CPU burst of 20msec followed by I/O of 60 msec. The scheduling list is as shown: **09**

Time	Scheduling List
0	P1, P2
10	P2, P1
20	P1, P2
25	P2
35	-
45	P2
55	P1, P2

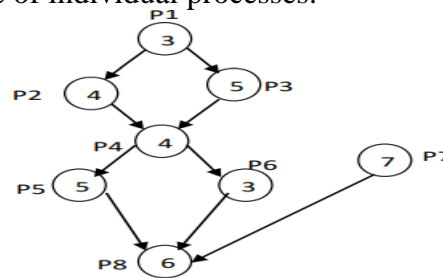   c) Illustrate how hybrid thread interacts with the user level and kernel level threads **05**

OR

3. a) Consider the following process to explain the HRN policy. Calculate response ratio, mean of weighted turn-around time and turn-around time and plot it **08**

Process	P1	P2	P3	P4	P5
Arrival time (sec)	1	3	5	8	9
Service time (sec)	3	2	2	4	1.

	b)	Analyse FCFS scheduling policy with an example	**06**
	c)	Explain three approaches of real time scheduling. For the following PPG calculate the deadline of individual processes.	**06**

UNIT - III

4	a)	Consider a scenario wherein the program is prepared to execute from the memory area 5000. But the memory is not available and the free memory is available from 7600. Compute the effective memory address for relocation and also explain the relocation register.	**05**
	b)	Analyse memory fragmentation and illustrate the various forms of fragmentation.	**05**
	c)	Demonstrate the non-contiguous memory allocation for a process P of size 140K in the memory space with fragments of 50K, 20K, 80K and 70K.	**06**
	d)	Diffrentiate between static and dynamic memory allocation.	**04**

OR

5	a)	What is heap? With a neat diagram and an example explain process involved in heap.	**07**
	b)	Compare and contrast contiguous and non-contiguous allocation.	**07**
	c)	Demonstrate the address translation in paged virtual memory system.	**06**

UNIT - IV

6	a)	Define deadlock. With an example, explain the resource deadlock	**06**
	b)	Analyse the Mailbox interprocess message passing scheme highlighting its advantages.	**06**
	c)	A system has four processes P1, P2, P3, P4 and 5, 7, 5 resource units of resource classes R1, R2, R3. Process P3 makes a request of 1 unit of resource class R1. Check whether the system is in deadlock	**08**

R1	R2	R3		R1	R2	R3
2	1	0		2	1	0
1	3	1		1	3	1
1	1	1		1	1	1
1	2	2		1	2	2

Allocated resources   Requested resources

UNIT - V

7	a)	Justify that sequential processing of records in file system is less efficient than processing of records in sequential files.	**06**
	b)	Analyse with diagram File Allocation Table (FAT)	**06**
	c)	Illustrate file control block highlighting its operations.	**08**

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