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Department of Computer Science and Engineering

B. Sc (Engg) in Computer Science and Engineering

Semester Final Online Examination - 2019 (Jul-Dec)

Level: 3   Semester: II   Credit Hours: 3.0   Course Code: CSE 353

Course Title: Operating System

Time: 1 Hour 30 Minutes   **Total Marks: 90**

[NB: The figure in the right margin indicates the marks for the respective question.
Split answer of any question is unacceptable]

Section-A
Answer any 3 (three) questions from the following

1.	a)	Draw the diagram of the Computer System Components. Explain the difference between the System Programs and Application Programs.	4+4
	b)	Describe the two general roles of an operating system, and elaborate why these roles are important.	7
2.	a)	Draw the diagram for Operating System Services.	7
	b)	List Four resources that will be allocated by an operating system to users and processes.	4*2=8
3.	a)	Draw the diagram of the process parts in memory. List the information items stored in Process Control Block (PCB).	4+5
	b)	Calculate the average waiting time for the First Come First Serve (FCFS), Shortest Job First (SJF), and Priority Scheduling algorithm for the below processes table.	3*2=6

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

4.	a)	What resources are used when a thread is created? How do they differ from those used when a process is created?	4+3
	b)	What do you mean by ready queue and device queue? Represent process scheduling with the help of a queuing diagram.	4+4

5. a) What is *deadlock?* What is *starvation?* How do they differ from each other?   2+2+3

    b) Consider three sets A, B and C for Process, Resource and Edges where   8
        A={A1,A2,A3,A4}
        B={B1,B2}
        C={A1→B1,A3→B2,B1→A2,B1→A3,B2→A1,B2→A4}
        Draw a resource allocation graph for these sets and find is there any deadlock or not? Explain your answer.

6. a) What must the *banker's algorithm* know a priori in order to prevent   4+4+2=10
        deadlock? Describe the general strategy behind *deadlock prevention*, and
        give an example of a practical deadlock prevention method.

    b) Assuming the operating system detects the system is deadlocked, what can   5
        the operating system do to recover from deadlock?

7. a) What are the Benefits of Virtual Memory? Draw The General Layout of   4+4
        Virtual Memory.

    b) What is swapping? Can swapping permit an application requiring 16M   2+5
        memory to run on a machine with 8M of RAM?

8. a) List and describe the four memory allocation algorithms. Which two of the   8+2
        four are more commonly used in practice?

    b) Why are segmentation and paging sometimes combined into one scheme?   3+2
        Give an example where the contiguous allocation of file blocks on disks
        can be used in practice.