CBCS SCHEME

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15CS64

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Operating Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What is operating system? Explain multiprogramming and time sharing systems. **(06 Marks)**
   b. Explain dual mode operating in operating system with a neat block diagram. **(05 Marks)**
   c. What are system calls? Briefly point out its types. **(05 Marks)**

OR

2 a. Explain process states with state transition diagram. Also explain PCB with a neat diagram. **(06 Marks)**
   b. What is interprocess communication? Explain its types. **(05 Marks)**
   c. With a neat diagram, explain the concept of virtual machines. **(05 Marks)**

Module-2

3 a. For the process listed below, draw Gantt charts using pre-emptive and non-preemptive priority scheduling algorithm. A larger priority number has a higher priority. Calculate Average Weighing Time and Average turnaround time.

Jobs	Arrival Time	Burst Time	Priority
J_1	0	6	4
J_2	3	5	2
J_3	3	3	6
J_4	5	5	3

(06 Marks)

   b. Is CPU scheduling necessary? Discuss the five different scheduling criterias used in the computing scheduling mechanism. **(05 Marks)**
   c. Explain multithreading models. **(05 Marks)**

OR

4 a. Define semaphores. Explain its usage and implementation. **(06 Marks)**
   b. Explain Reader-Write problem with semaphore in detail. **(05 Marks)**
   c. What are monitors? Explain dining Philospher's solution using monitor. **(05 Marks)**

Module-3

5 a. System consists of five jobs (J_1, J_2, J_3, J_4, J_5) and three resources (R_1, R_2, R_3). Resource type R_1 has 10 instances, resource type R_2 has 5 instances and R_3 has 7 instances. The following snapshot of the system has been taken.

Jobs	Allocation			Maximum			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
J_1	0	1	0	7	5	3	3	3	2
J_2	2	0	0	3	2	2			
J_3	3	0	2	9	0	2			
J_4	2	1	1	2	2	2			
J_5	0	0	2	4	3	3			

Find need matrix and calculate the safe sequence by using Banker's algorithm. Mention the above system is safe or not safe. **(06 Marks)**

   b. What is dead lock? What are necessary conditions an operating system must satisfy for a dead lock to occur?   **(05 Marks)**

   c. What is a Resource Allocation Graph (RAG)? Explain how RAG is very useful is describing deadly embrace by considering own example.   **(05 Marks)**

OR

6   a. What are Translation Load aside Buffer (TLB)? Explain TLB in detail with a simple paging system with a neat diagram.   **(06 Marks)**

   b. Given the memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K apply first fit, best fit and worst fit algorithms to place 212K, 417K, 112K and 426K.   **(05 Marks)**

   c. Describe both internal and external fragmentation problems encountered in a contiguous memory allocation scheme.   **(05 Marks)**

Module-4

7   a. Consider the following page reference stream: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for LRU and FIFO replacement algorithms assuming 3 frames? Which one of the above is most efficient?   **(06 Marks)**

   b. Explain demand paging system.   **(05 Marks)**

   c. What is thrashing? How can it be controlled?   **(05 Marks)**

OR

8   a. Explain briefly the various operations performed on files.   **(06 Marks)**

   b. Explain the various access methods of files.   **(05 Marks)**

   c. Explain various allocation methods in implementing file systems.   **(05 Marks)**

Module-5

9   a. Explain the various Disk Scheduling algorithms with example.   **(08 Marks)**

   b. Explain access matrix method of system protection.   **(08 Marks)**

OR

10   a. With a neat diagram explain in detail components of a Linux system.   **(06 Marks)**

   b. Explain the different IPC mechanisms available in Linux.   **(05 Marks)**

   c. Explain process scheduling in a Linux system.   **(05 Marks)**

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