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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