CBCS SCHEME

USN | | | | | | | | | | |

15CS64

Sixth Semester B.E. Degree Examination, Dec: 17 n.2020
Operating Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE fall 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 Averag

Jobs	Arrival Time	Burst Time	Priority
J_1	0	6	
J_2	3	5	
J3	3	3	
J4	5	5	

(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 (J1, J2, J3, 11, J5) and three resources (R1, R2, R3). Resource type R_1 has 10 instances, resource type R2 has 5 instances and R3 has 7 instances. The following snapsh

Jobs	Allocation			Maximum			Available		
	R1	R2	R3	R1	R2	R3	R1		R3
Ji							3	3	2
J2									
J3									
J4									
J5									

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

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

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