17CS64

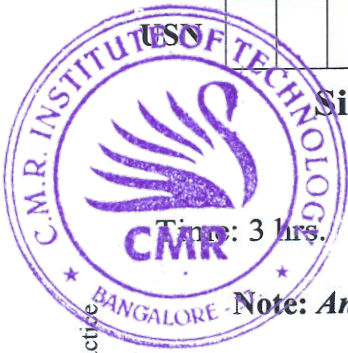**Sixth Semester B.E. Degree Examination, Jan./Feb. 2023**
Operating System

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Explain four components of computer system with neat diagram.   **(04 Marks)**
   b. Explain the services of Operating System that are helpful for user and system. **(10 Marks)**
   c. Distinguish between the following terms :
       i)   Multiprogramming and Multitasking.
       ii) Multiprocessor systems and clustered systems.   **(06 Marks)**

OR

2 a. Analyse modular kernel approach with layered approach of OS structure using neat diagrams. **(06 Marks)**
   b. What are System Calls? Demonstrate the different system calls executed during copying a file to another file. **(08 Marks)**
   c. Define Process. Explain process states with state transition diagram.   **(06 Marks)**

Module-2

3 a. Explain Multi – threading model. List the benefits of Multi threading model.   **(06 Marks)**
   b. Explain Scheduling criteria that kept in mind while choosing CPU scheduling algorithms. **(04 Marks)**
   c. Draw Gantt charts using FCFS , SJF and Round Robin (Q = 2). Compute Average waiting time and Average turn around time for each. **(10 Marks)**

Processes	P_1	P_2	P_3	P_4	P_5
Burst time	7	2	3	1	3

OR

4 a. Write N – process solution to critical section problem using TestAndSet ( ) atomic instruction. Discuss how the solution satisfies all requirements of critical section. **(08 Marks)**
   b. Show how semaphores provide solution for readers – writers problem.   **(08 Marks)**
   c. Explain Syntax and Semantic views of Monitors.   **(04 Marks)**

Module-3

5 a. Define Deadlock. Discuss the necessary conditions of deadlock.   **(05 Marks)**
   b. Consider the following snapshot of a system :

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's Algorithm :
i) Calculate Need matrix.
ii) Is the system in a safe state?
iii) If request from process P1 arrives for (0, 4, 2, 0) can the request be granted
immediately? (10 Marks)
c. What is Wait - for graph? Illustrate deadlock detection using Wait – for graph. (05 Marks)

OR

6 a. Differentiate between Internal and External fragmentation. (04 Marks)
b. What is Paging? Explain Paging hardware with TLB (Translation Lookahead Buffer) with neat diagram. (08 Marks)
c. Define Thrashing. Discuss the impact thrashing and solutions to thrashing. (08 Marks)

Module-4

7 a. Define Page Fault. With neat diagram, explain the steps involved in page fault handling. (10 Marks)
b. Consider following reference string with 3 frames available 0, 9, 0, 1, 8, 1, 8, 7, 8, 7, 1, 2, 8, 2, 7, 8, 2, 3, 8, 3. How many page fault would occur for FIFO , Optimal and LRU (Least Recently Used) page replacement algorithms? (10 Marks)

OR

8 a. Define File. Explain different attributes of a file. (06 Marks)
b. Explain different allocation methods in implementing file system. (08 Marks)
c. Explain various types of directory structures. (06 Marks)

Module-5

9 a. With illustrative example, distinguish between FCFS , SSTF , SCAN and LOOK disk scheduling algorithms. (08 Marks)
b. What is Access Matrix? Explain different methods of implementing access matrix. (06 Marks)
c. Discuss about Boot blocks and Bad blocks. (06 Marks)

OR

10 a. With a neat diagram, explain the components of Linux Operating System. (10 Marks)
b. Explain Design principle of Linux. (05 Marks)
c. Explain Inter process communication in Linux OS. (05 Marks)

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