Total No. of Questions : 08]

SEAT No. :

P-1592

[Total No. of Pages : 3

[6002]-222
S.E. (Artificial Intelligence and Data Science)
OPERATING SYSTEMS
(2019 Pattern) (Semester - III) (217521)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve questions Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary***

Q1) a) What is synchronization? Operating system support and programming language support for synchronization. **[6]**

b) What is inter process communication? Explain pipes and shared memory. **[6]**

c) What are classical synchronization problems? Explain any one in detail. **[6]**

OR

Q2) a) What is deadlock? Explain its characteristics with example. **[6]**

b) What are different methods of handling deadlock? Explain deadlock detection with example. **[6]**

c) Consider a system that contains five processes P1, P2, P3, P4, P5 and the three resource types A, B and C. Following are the resources types: A has 10, B has 5 and the resource type C has 7 instances. Determine if the system is safe or not. **[6]**

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

P.T.O.

Q3) a) Explain the virtual memory system with suitable diagram. **[6]**

b) Explain the basic method for implementing paging. Draw the paging model of logical and physical memory. **[6]**

c) What is swapping? Does swapping increase the Operating system's overheads? **[6]**

OR

Q4) a) Explain the differences between: **[6]**

i) Logical and physical address space

ii) Paging and segmentation

b) What is internal fragmentation and external fragmentation? How are they reduced? **[6]**

c) What are advantages of partitioning the memory? What are different ways memory partitioning? **[6]**

Q5) a) List and explain file types and file access methods. **[6]**

b) What are different disk scheduling policies? Explain SCAN and CSCAN with example. **[6]**

c) Explain how free space management is done by Operating Sytem? **[5]**

OR

Q6) a) What are different disk scheduling policies? Explain LIFO and SCAN with example. **[6]**

b) Given memory partition of 100K, 500K, 200K, 300K and 600K(in order). How would each of First fit, best fit and worst fit algorithm place processes of size 212K, 417K, 112K, 426K (in order)? Which also makes the most efficient use of memory. **[6]**

c) What is Directory? Explain directory implementation and allocation methods. **[5]**

Q7) a) What are goals of Linux? Also interfaces to linux. **[6]**

b) What is kernel? Explain structure of kernel. **[6]**

c) Explain various process management system calls in Linux with example. **[5]**

OR

Q8) a) Define the components of LINUX system with diagram. What is the responsibility of kernel in LINUX operating system? **[6]**

b) What are different Process management system calls in Linux. Explain exec() and brk() in detail. **[6]**

c) Explain implementation of process and threads in Linux. **[5]**

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