Total No. of Questions : 10]

SEAT No. :

PE-5721

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S.E. (Computer/Computer Science& Engg.)

PCC-203-COM : OPERATING SYSTEMS

(2024 Pattern) (Semester - III)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Attempt Q.1, or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 and Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Numeric figures in square brackets [] indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) List different types of Operating Systems? Describe any two of them. **[5]**

b) What is a system call? Explain its need in operating systems. **[5]**

c) Describe the various functions of an Operating System. **[4]**

OR

Q2) a) Explain the layered approach of OS design with the help of diagram. Discuss its advantages and disadvantages. **[5]**

b) Explain the main objectives of an Operating System. How does an OS act as a resource manager and control program? Give examples. **[5]**

c) Explain Microkernel Operating Systems? **[4]**

Q3) a) Explain Process States and Transitions diagram? **[7]**

b) Explain the following types of Schedulers. **[7]**

i) Short Term

ii) Long Term

iii) Medium Term

OR

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Q4) a) Explain the Process Control block in detail with the help of a diagram. **[7]**

b) Draw Gantt chart and calculate Avg. turnaround time, Avg. waiting time for the following process using SJF non-pre-emptive and round robin with time quantum 0.5 Unit. **[7]**

Process	Burst time	Arrival Time
P1	2	10
P2	1	10
P3	1	11
P4	1	12

Q5) a) Write and explain Deadlock Avoidance Bankers Algorithm. **[6]**

b) Explain necessary conditions for occurrence of deadlock. **[4]**

c) What is semaphore? Justify how semaphore is used to solve critical section problems. **[4]**

OR

Q6) a) Write a short note on the following with an example? **[6]**

i) Semaphore

ii) Monitors

iii) Mutex

b) Explain Deadlock prevention and deadlock recovery with example? **[4]**

c) What is semaphore? Write a solution to the Reader Writer problem using Semaphore with Readers as priority. **[4]**

Q7) a) Explain FIFO and LRU page replacement policies? Consider page sequences 2, 3, 2, 1, 5, 4, 5, 3, 2, 2,2, 5, 2 and discuss working with FIFO replacement policy. Also count page faults. (Use no. of frames = 3). **[7]**

b) Write a short note on following with diagram. **[7]**

i) Segmentation

ii) Demand Paging

OR

Q8) a) Explain following placement strategies: First Fit, Best Fit and Worst Fit. **[7]**

b) What is internal fragmentation? Explain with a suitable diagram and example. **[7]**

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Q9) a) Explain File operation and Directory structure? **[5]**

b) Explain File Allocation Methods? **[5]**

c) Compare FAT, NTFS, EXT, and HFS file systems based on structure, performance, and security. **[4]**

OR

*Q10)*a) Describe Boot-block and Bad blocks? **[5]**

b) Explain Disk formatting? **[5]**

c) Explain LOOK scheduling. How is it different from SCAN? **[4]**



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