Bachelor in Computer Applications
Course Title: Operating System
Code No: CACS 251
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. [6×5 = 30]

2. How multitasking is different from multiprocessing? Explain microkernel in detail. [2+3]
3. What is critical section problem? How Peterson's solution can be used to achieve mutual exclusion? [1+4]
4. What is TLB? How can it be used in paging? Explain. [1+4]
5. What are advantages of distributed system over centralized system? Explain functional steps in remote procedure call with suitable diagram.
6. What is DMA? How can it be used to transfer data? Explain. [1+4]
7. Explain different attributes of a file. What is hierarchical directory system? [3+2]
8. What are authentication and authorization? Explain different authentication systems. [2+3]

Group C

Attempt any TWO questions. [2×10 = 20]

9. What are internal and external fragmentations? Explain how external fragmentation occurs in segmentation. Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB, and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB, and 375 KB (in order)? [2+3+5]

10. Consider the following set of processes, with the length of the CPU burst given in milliseconds: [4+4+2]

Process	Arrival Time	Burst Time	Priority
P1	0	6	2
P2	1	2	1
P3	3	3	2
P4	6	2	3

a) Draw Gantt charts showing the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority), and RR (quantum = 2ms).

b) Compute average waiting time and average turnaround time for each of these scheduling algorithms mentioned above.

c) What will happen if the quantum size is too large or too small in RR scheduling algorithm?

11. What are the four necessary conditions for deadlock to occur? Given three process A, B, and C and three resources X, Y, and Z are following events happen in the sequence as given:

a) A request X
b) B request Y
c) C request Z
d) A request Y
e) B request Z
f) C request X
g) C request Y

Assume that requested resource should be always be allocated to request process if it is available. Draw the resource allocation graph for the sequence and also mention whether it is deadlock? If it is how to recover the deadlock? [2+8]