Q.1
a. Explain the terms: Waiting time, Turnaround time, Response time and Throughput.

b. What is time slice? What is the importance of this value in a Time Sharing Operating System?

c. Give the schematic view of Virtual File Systems and describe the concept behind it.

d. What is the need of Inter Process Communication and how is it achieved?

e. Define the term thrashing and also explain how it affects the overall performance of CPU.

f. Differentiate between Dynamic relocation and Dynamic loading.

g. Describe role of Interrupt Handlers in device management. (7 × 4)

Q.2
a. Describe the advantages of Input / Output interfaces. What all components constitutes I/O interface? (6)

b. Explain the inverted page table mechanism of memory management. How a logical address is translated into physical address? (8)

c. What is compaction? How is it used to reduce external fragmentation in memory management? (4)

Q.3
a. When does a race condition arise and how it is resolved? In the following situation determine whether the system is in safe state. If so, give sequence of process. There are five process P₀, P₁, P₂, P₃ and P₄ and three resource types A (10 instances), B (5 instances) and C (7 instances). Snapshots a time T₀ is as follow: (12)
### Q.7 Write short notes on the followings:

(i) Layered Protocol  
(ii) Direct Memory Access  
(iii) Election Algorithm