MAX MARKS : 80   TIME : 03 HRS

N.B.   1. Question No 1 is **compulsory**.

        2. Solve any **three** questions out of remaining five questions.

        3. Assume suitable data if necessary.

Q. 1. Solve any **four** out of five sub questions

        a. What are the major functions carried out by an operating system?   (05)

        b. Describe the types of semaphores.   (05)

        c. Discuss the problem of consumer-producer.   (05)

        d. Explain various process scheduling queues.   (05)

        e. Differentiate between internal and external fragmentation.   (05)

Q. 2. a) Briefly explain the different kernel architectures.   (10)

       b) State the necessary conditions for deadlock. How to prevent the deadlock? (10)

Q. 3 a) Calculate number of page faults and page hits for the page replacement policies
        FIFO, Optimal & LRU for given reference string 6,0,5,2,0,3,0,4,2,3,0,3,2,5,2,0,
        5,6,0,5(assuming three frame size).   (10)

       b) Discuss the various file allocation methods.   (10)

Q. 4 a) What is mutual exclusion? Explain Peterson's algorithm for mutual exclusion. (10)

       b) Explain the file systems of Windows and Linux operating system.   (10)

Q.5 a) Assume that the disk head is initially positioned over track 100. For the disk space
        request of 27, 129, 110, 186, 147, 41, 10, 64 and 120. Show how disk scheduling
        is carried out for SSTF, C-SCAN, C-LLOK. Calculate the average seek length and
        show the tracing of the requests.   (10)

       b) Define the terms Critical section, Race condition, Process Control Block,
          Kernel and shell of OS , Context Switch.   (10)

Q. 6. Write a note on
        a. Comparison between FCFS & SJF scheduling algorithms.   (06)

        b. Paging and segmentation   (08)

        c. Process state diagram   (06)