

**2018**

Full Marks -. 40

Time - 3 hours

The questions are of equal value

Answer *all* questions.

1. a) What is an operating system ? What is the purpose of an operating system ? What is the necessity of an operating system.
- b) Briefly discuss the view of an OS as a Resource Manager and as a Device Manger.

OR

- c) What is a scheduler ? Describe the three different types of CPU scheduler in briefly.
  - d) Consider the set of process  $\langle P_1, P_2, P_3, P_4 \rangle$  with the length of CPU burst  $\langle 10, 1, 2, 1, 5 \rangle$  and they arrive in the same order at time 0. Find out the turn around and waiting time for each process using SJF.
2. Explain the various synchronization mechanisms available to provide interprocess communication and coordination.

OR

- a) How does ( ) operation associated with monitors differ from the corresponding operation defined for semaphores ?

- b) It is possible have a deadlock involving only a single process ? Explain your answer.
3. a) Explain the principles of segmentation with examples.  
b) What is pagefault ? When it occurs ? What are the actions taken by the OS when a page fault occurs ?

OR

- Consider the following sequences of memory references (0, 1, 4, 0, 3, 4, 0, 0, 1, 1, 3, 4, 3). Find the page fault rate for this reference string having 3 frames using LRU and optimal page replacement algorithm.
4. Suppose that the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and just finished a request at track 125. The queue of request is kept in the FIFO order 86, 147, 91, 177, 94, 150, 102, 175, 130. Using FCFS, SSTF SCAN disk scheduling algorithm to calculate total movement.

OR

- a) Why might a system use interrupt-driven I/O to manage a single serial port and polling I/O to manage a front-end processor such as concentrator.
- d) Write notes on the following :
- (i) DMA      (ii) Polling