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T.E. (Information Technology)
OPERATING SYSTEMS
(2019 Pattern) (Semester-I) (314442)

Time : 2½ Hours]   *[Max. Marks : 70*
Instructions to the candidates:
   1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
   2) Neat diagrams must be drawn wherever necessary.
   3) Figures to the right indicate full marks.
   4) Assume Suitable data if necessary.

Q1) a)   Explain the following with example   **[9]**

      i)   Mutual Exclusion

      ii)   Synchronization

      iii)   Race condition

   b)   What is Critical Section problem? Explain readers- writers problem.**[9]**

<p align="center">OR</p>

Q2) a)   Enlist different IPC techniques. Differentiate between named pipe and unnamed pipe with suitable example.   **[9]**

   b)   What is Critical Section problem? Give semaphore solution for producer-consumer problem.   **[9]**

Q3) a)   What is page Fault? For the given reference string with 3- page frame available, determine the number of page faults for FIFO and LRU algorithms: 3,5,7,2,1,5,4,6,7,4,1,2.   **[9]**

   b)   Explain Demand paging with the help of neat diagram.   **[8]**

<p align="center">OR</p>

Q4) a)   Explain Buddy System with the help of neat diagram and example.   **[9]**

   b)   What is segmentation? How address Translation is performed in segmentation system?   **[8]**

Q5) a) Assume a disk with 200 tracks and the disk request queue has random requests in it as follows: 55,58,39,18,90,160,150,38,184. **[12]**

Find the no of tracks traversed and average seek length if

    i)   SSTF

    ii)   SCAN

    iii) C-SCAN is used and initially head is at track no 100.

  b) What are typical operations that may be performed on a directory? **[6]**

OR

Q6) a) What is I/O buffering? Why I/O buffering is needed? State and explain different approaches of I/O buffering. **[9]**

  b) Explain with example any three disk scheduling criteria. **[9]**

Q7) a) List down the phases of a compiler. Explain with suitable example. **[9]**

  b) Explain macro call and macro expansion with suitable example. **[8]**

OR

Q8) a) What is Loader? What are the basic functions of loaders? **[10]**

  b) What is system software? Explain any four system software in brief? **[7]**

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