Total No. of Questions : 8]

SEAT No. :

**PB3640**

[6261]-48

[Total No. of Pages :2

# S.E. (Artificial Intelligence and Data Science)

## OPERATING SYSTEMS

## (2019 Pattern) (Semester- III) (217521)

*Time : 2½ Hours ]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Solve 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) What is a deadlock? State and explain the conditions for deadlock to occur. **[6]**

b) Write the structure of Producer-Consumer problem in bounded buffer using semaphore. Discuss how critical section requirements are fulfilled? **[6]**

c) What is semaphore? Explain the concept of binary semaphore. **[5]**

OR

***Q2)*** a) State and explain in brief different methods of handling deadlock. **[6]**

b) What is Readers-Writers problem? How Reader and Writer processes synchronize? **[6]**

c) What is monitor? Explain the concept of monitor with example. **[5]**

***Q3)*** a) Explain segmentation with suitable diagram. **[6]**

b) How sharing and protection is provided in a paging system? Explain with suitable diagram. **[6]**

c) Explain with example first-fit, best-fit and worst-fit memory allocation techniques. **[6]**

OR

***P.T.O.***

***Q4)*** a) Explain paging with suitable diagram. **[6]**

b) Write a short note on swapping. **[6]**

c) What are the advantages and disadvantages of fixed and dynamic partitioning of memory? When there is a need of compaction? **[6]**

***Q5)*** a) Which are different file organization techniques? Describe any one in brief. **[6]**

b) What is an I/O buffer? What is its use? **[6]**

c) Describe any one disk scheduling policy with an example. **[5]**

OR

***Q6)*** a) What are the file access methods? Explain them in detail. **[6]**

b) Describe working of FIFO and C-SCAN algorithms with suitable diagrams. **[6]**

c) Write a note on free space management. **[5]**

***Q7)*** a) How process and threads are implemented in Linux? Explain. **[6]**

b) How process scheduling is performed in Linux? **[6]**

c) What are goals of Linux? Also interfaces to linux. **[6]**

OR

***Q8)*** a) Explain process management system calls in Linux. **[6]**

b) Write a short note on kernel structure. **[6]**

c) Define the components of LINUX system with diagram. What is the responsibility of kernel in LINUX operating system? **[6]**