

Total No. of Questions : 8]

SEAT No. :

PA-1295

[Total No. of Pages : 3

[5925]-326

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 questions 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 deadlock detection and recovery? Explain two options of deadlock recovery. **[6]**

b) What is the producer consumer problem? How to solve it using semaphore and Mutex? **[6]**

c) What are different types of classical synchronization problems? Explain any one in detail. **[6]**

OR

Q2) a) What is Inter Process Communication? Why it is important for operating system. **[6]**

b) Write short note on critical section, Monitors and mutex. **[6]**

c) What do you mean by pipe? Explain anonymous and named/FIFO pipe. **[6]**

Q3) a) Explain the following term : **[6]**

- i) Compaction
- ii) Belady's anomaly
- iii) Thrashing

P.T.O.

- b) Why is the principle of locality crucial to use of virtual memory? Explain with example. [6]
- c) Reference String 1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3. Execute LRU and OPR on above string. Consider page frame of 3 pages Write page hit and page faults if any. [5]

OR

- Q4)** a) Write and explain algorithms for : [6]
- i) Allocating region
 - ii) Freeing region
- b) Differentiate between : [6]
- i) Internal and external fragmentation
 - ii) Fixed and variable size partitioning
- c) Explain in brief what is paging and segmentation. How logical physical Address Translation is done in both. [5]

- Q5)** a) What is file system? Explain File system implementation in detail. [6]
- b) Explain following term with respect to directory structure [6]
- i) Two level directory structure (with diagram)
 - ii) Tree structured Directories (with diagram)
- c) Define following term with respect to disk access [6]
- i) Seek time
 - ii) Rotational Latency
 - iii) Data transfer time

OR

- Q6)** a) Explain directory structure with types its types. Also discuss directory implementation in details. [6]
- b) What is free space management (FSM)? Explain how bit vector and linked list performs on FSM. [6]
- c) What is the advantage of the double buffering scheme over single buffering? [6]

- Q7)** a) Explain scheduling in [6]
i) Linux Operating Systems
ii) UNIX free BSD OS
b) Explain grep utility and its variations with examples. [5]
c) Explain system calls exec() and brk(). [6]

OR

- Q8)** a) What are the requirements for Linux system administrator? Define the design principles of LINUX systems. [6]
b) Explain different types of hypervisors. [5]
c) Explain in detail the memory management in LINUX system. [6]

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