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Paper Code : BCAC302 Operating System

UPID : 300069

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) The condition for Deadlock claiming exculsive control over resources is known as _____

(II) Mapping with blocks of fixed size _____

(III) The process of _____ in computer security is to protect data by converting it into a coded format to prevent unauthorized access or interception.

(IV) _____ system consists of multiple processors and a method for communication between the processors.

(V) _____ is the process of dividing a distributed system into smaller, manageable components.

(VI) The electronic part of an I/O device is called device _____

(VII) Strategies dealing with which pages to be replaced in primary memory _____ strategies

(VIII) term for a block of memory that is currently not in use and cannot be allocated to any process _____

(IX) Full form of CAPTCHA is _____

(X) In a multiprocessor system, _____ is the term for a shared memory location that multiple processors are attempting to access and modify simultaneously

(XI) Term used to describe a copy of a portion of a distributed database stored at a local site is _____

(XII) Innermost layer of OS interacting with the Hardware is _____

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Explain Best Fit, Worst Fit & First Fit Strategies with respect to memory placement Strategies [5]
3. Explain the concept of multiprocessor systems. Discuss the advantages and challenges associated with using multiprocessor systems in computer architecture. [5]
4. Explain the priority-based scheduling algorithm in operating systems, including its characteristics, advantages, disadvantages, and situations in which it is most suitable. [5]
5. With proper diagram, explain the various states (and state transitions) of process [5]
6. Describe Distributed Processing. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) Describe the term "Multiprocessor Interconnection Synchronization" [5]
   (b) Discuss the implementation of Parallel computing [5]
   (c) Discuss the disadvantages on multiprocessor systems [5]
8. (a) Describe fragmentation & replication [5]
   (b) Differentiate between Vertical and Horizontal Fragmentation [5]
   (c) With proper example, differentiate between Global Schema & Local Schema [5]
9. (a) Discuss the significance of 'execute' permission on a directory. How do we find whether execute permission is enabled or not [5]
   (b) Discuss how external and internal commands are actually executed in Unix [5]
   (c) Differentiate between a hard link &a soft link - give the command for creation of both. [5]
10. (a) Explain Belady's Anomaly with an example [5]
    (b) If we go increasing the size of cache memory, will the system performance also keep on increasing ? - Justify your answer with proper diagram [5]
    (c) In Unix, what is the fate of a process when its parent terminate before it ? Write a C code to display the PID and PPID of a process. [2+3]

11. (a) Describe the Dining Philosopher Problem with respect to process synchronization. [6]

(b) Describe the following terms: [4]

1) Mutual Exclusion
2) Race Condition
3) Critical Section
4) Process Synchronization

(c) Explain the solution suggested by Banker's Algorithm with proper example. [5]

*** END OF PAPER ***