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Total No. of Pages: 02
Total No. of Questions: 09

B. Tech.(CSE, IT) (Sem.4th)
OPERATING SYSTEM
Subject Code-CS-202
Paper ID-A0458

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTION TO CANDIDATES:

1. *Section-A is COMPULSORY consisting of TEN questions carrying 2 marks each.*
2. *Section-B contains FIVE questions carrying five marks each and students have to attempt any FOUR questions.*
3. *Section-C contains THREE questions carrying TEN marks each and students have to attempt TWO questions.*

Section – A

(2x10=20)

1. Define the followings
 - a) System Call
 - b) Multiprogramming
 - c) Race Condition
 - d) Context Switch
 - e) TLB
 - f) Demand Paging
 - g) Belady's problem
 - h) Process Control Block
 - i) Access Matrix
 - j) Cryptography

Section - B

(5x4=20)

2. Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames.
 - a) How many bits are there in the logical addresses?
 - b) How many bits are there in the physical addresses?
 - c) If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?
 - d) Why is page size always a power of 2? [1,1,1,2]
3. What are semaphores? How are they helpful in process synchronization? Explain the concept with suitable example.

4. Apply deadlock detection algorithm to the following data and shows the results:

Available = (2,0,0,1)

$$\text{Request} = \begin{Bmatrix} 2 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 2 & 1 & 0 & 0 \end{Bmatrix} \quad \text{Allocation} = \begin{Bmatrix} 0 & 0 & 1 & 0 \\ 2 & 1 & 0 & 1 \\ 0 & 0 & 2 & 0 \end{Bmatrix}$$

5. Discuss different file allocation methods in detail.
6. What are different types of schedulers? Explain the concept with suitable example.

Section - C

(2x10=20)

7. Consider the following page reference string:

4,0,0,0,2,4,2,1,0,3,2

Assume the page replacement algorithms are Optimal and LRU.

- Find out the page faults in each using three page frames.
- How many page faults will occur if the working set policy with LRU is used with a window size of 4?
- Explain thrashing. [4,4,2]

8. Write Short note on any two of the followings:

- Protection
- Unix File Structure
- Internal and External fragmentation

9. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The current head position is at cylinder 143. The queue of pending requests is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. What is the total distance that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?

- SSTF
- SCAN

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