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Subject Code: ACSE0403A/ACSE0403B

Roll No:

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4-f.

INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)

Affiliated to Dr. A.P. J Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course B.Tech.

Branch CSE/IT/AI/ML/AI/DS/CS/IOT

Semester IV

Examination PUT

Year- (2021-22)

Subject Name: Operating Systems

Time: 2:00 Hrs

Max. Marks:60

General Instructions:

1. This Question paper consists of..... pages & questions. It comprises of three Sections -A, B, & C.
2. **Section A** -Q.No- 1 is Very short answer type questions carrying 1 mark each, Q. No- 2 is Short Answer type-I Question carrying 2 mark each. You are expected to answer them as directed.
3. **Section B** -Q.No-3 is Short Answer type-II questions carrying 5 marks each. Attempt any four out of five questions given.
4. **Section C** -Q. No-4 is Long Answer type questions carrying 6 marks each. Attempt any four out of six questions given.

SECTION - A

1. Attempt all parts-

[8x1=08]

- 1-a. Explain demand paging. (1) CO4
- 1-b. Define principal of concurrency. (1) CO3
- 1-c. Explain the difference between Physical and logical address. (1) CO4
- 1-d. Explain: Seek Time, Rotational Latency & Bandwidth of a disk. (1) CO5
- 1-e. Explain Semaphore & its usage. (1) CO3
- 1-f. Explain the requirements that a solution to the critical section problem must satisfy. (1) CO3
- 1-g. Differentiate between Cooperating processes & independent processes. (1) CO3
- 1-h. List out the various file attributes. (1) CO5

2. Attempt all parts -

[4x2=08]

- 2-a. Explain Virtual Memory. (2) CO4
- 2-b. Define Belady's anomaly with example. (2) CO4
- 2-c. Write a short note on interprocess communication. (2) CO3

- 2-d. Explain Thrashing. State the cause of Thrashing and discuss its solution. (2) CO4

SECTION - B

3. Attempt any four out of five questions- [4x5=20]

- 3-a. Explain paging. Describe how logical address is translated to physical address in a paged system. (5) CO4
- 3-b. When do page faults occur? Describe in detail the actions taken by the operating system when a page faults occur. (5) CO4
- 3-c. Given: Logical Address Space of 4 GB, Physical Address Space of 64 MB, Size of a page is 4 KB. Find out the number of pages & number of frames also find the entries in the page table & Size of the page table. (5) CO4
- 3-d. Given memory partition of 100k, 200k, 400k, 500k, 600k (in order). How would each of First Fit, Best Fit, Worst Fit algorithm place processes of 288k, 425k, 125k and 453 k (in order). (5) CO4
- 3-e. Differentiate between internal fragmentation and external fragmentation. (5) CO4

SECTION - C

4. Attempt any four out of six questions- [4x6=24]

- 4-a. Suppose the head of a moving-head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following Disk scheduling algorithms? (6) CO5
(a) FCFS (b) SCAN (c) SSTF (d) C-SCAN
- 4-b. State Reader-Writer problem and give a solution using semaphore. (6) CO4
- 4-c. Explain about different directory structure in detail. (6) CO5
- 4-d. Consider the following reference string (6) CO4
1, 3, 2, 4, 0, 1, 5, 6, 0, 1, 2, 3, 0, 5, 6, 4, 2, 1, 3, 2, 7, 3, 2.
How many page faults will occur for:
i. FIFO Page Replacement
ii. Optimal Page Replacement
iii. LRU Page Replacement
Assuming three frames (initially empty).

- 4-e.** Define Message passing and shared memory in inter-process (6) CO3 communication. Also Discuss the Peterson Algorithm for two process solution in process synchronization.
- 4-f.** Describe various file allocation methods with their advantages (6) CO5 and disadvantages.

————THE END ————