



**DHARMSINH DESAI UNIVERSITY, NADIAD**  
**FACULTY OF TECHNOLOGY**  
**B.TECH. SEMESTER VI [IT]**

**SUBJECT: (IT-607) APPLIED OPERATING SYSTEM**

**Examination : Third Sessional**

**Date : 24/03/2021**

**Time : 45 minutes**

**Seat No. : \_\_\_\_\_**

**Day : Wednesday**

**Max. Marks : 16**

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**INSTRUCTIONS:**

1. Figures to the right indicate maximum marks for that question.
  2. The symbols used carry their usual meanings.
  3. Assume suitable data, if required & mention them clearly.
  4. Draw neat sketches wherever necessary.
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**Q.2 Answer any two of the following:**

**[08]**

**(A)** A certain computer system has the segmented paging architecture for virtual memory. The memory is byte addressable. Both virtual and physical address spaces contain 216 bytes each. The virtual address space is divided into 8 non-overlapping equal size segments. The memory management unit (MMU) has a hardware segment table, each entry of which contains the physical address of the page table for the segment. Page tables are stored in the main memory and consists of 2byte page table entries and page size is 128 bytes. Calculate total number of bits required for segment, pages, offset and frames.

**[04]**

**(B)** Consider a virtual address space of 64 bits and page size of 16KB. System is having a RAM of 256KB. Then what will be the size of Page Table and Inverted Page Table if each entry in both is of size 8B.

**[04]**

**(C)** Write a program to create a ticket booking module for two users. Both the users first check the availability of tickets, system asks them to enter number of tickets to be booked, if required tickets are lesser than the available tickets then tickets will be booked, otherwise error message will be printed. In order to maintain consistency use concept of semaphores.

**[04]**

**Q.3 Answer the following:**

**[08]**

**(A) (i)** Use this track request sequence: 100, 185, 39, 124, 16, 128, 67, 69

**[02]**

- Total Tracks = 200, starting from 0 to 199

- Currently head is present at 50 and moving towards 199 on its service pass.

- In service pass total seek time is 2 ms moving one track to another.

- Also assume that movement from one end to another without serving any request takes only 10 ms. What is total time required servicing all these requests using C-Scan Disk Scheduling?

**(ii)** Why the following situation occurs and what is it called?

**[02]**

‘A process is spending more time in paging than executing’

**(B)** Use this page-reference string: 2, 3, 4, 5, 3, 2, 6, 7, 3, 2, 3, 4

**[04]**

Total 3 frames are allocated and all three frames are empty initially. How many page-fault would occur for Optimal Page Replacement algorithm?

**OR**

**Q.3 Answer the following:**

**[08]**

**(A) (i)** Use this track request sequence: 100, 185, 39, 124, 16, 128, 67, 69

**[02]**

- Total Tracks = 200, starting from 0 to 199

- Currently head is present at 50 and moving towards 199 on its service pass.

- In service pass total seek time is 2 ms moving one track to another.

- Also assume that movement from one end to another without serving any request takes only 10ms. What is total time required servicing all these requests using C-Look Disk Scheduling?

**(ii)** In page-fault frequency (PFF) strategy to control the thrashing what is the significance of lower bound? What if we don't use lower bound?

**[02]**

**(B)** Use this page-reference string: 2, 3, 4, 5, 3, 2, 6, 7, 3, 2, 3, 4

**[04]**

Total 3 frames are allocated and all three frames are empty initially. How many page-fault would occur for Least-Recently Used algorithm?

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