VT-April-10- 121

Con. 3453–10. (REVISED COURSE) **AN–4309**
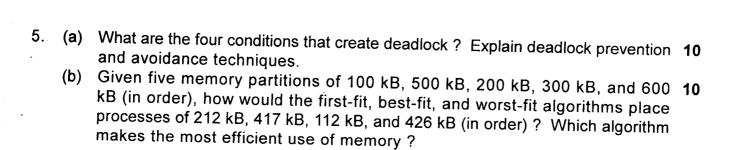
(3 Hours) [**Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
    (2) Attempt any **four** questions out of remaining **six** questions.
    (3) Assume **suitable data** wherever **required** but justify them.
    (4) **All** questions carry **equal** marks.
    (5) Answer to **each new question** to be started on a **fresh page**.
    (6) **Figures** to the **right** indicate **full** marks.

1. (a) What are the various real-time CPU scheduling algorithms. Explain each one in brief. **10**
   (b) What are requirements of mutual exclusion ? Explain Peterson's algorithm for mutual exclusion. **10**

2. (a) What are two differences between user-level threads and Kernel-level threads ? Under what circumstances is one type better than the other ? **10**
   (b) Consider the following page reference string :– **10**
    1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6
    How many page faults would occur for the following replacement algorithms assuming one, two, three, four, five, six or seven frames ?
     – LRU Replacement
     – FIFO Replacement
     – Optimal Replacement.

3. (a) How does DMA increase system concurrency ? How does it complicate hardware design ? **10**
   (b) How do caches help improve performance ? Why do systems not use more or larger caches if they are so useful ? **10**

4. (a) What are the various disk scheduling algorithms. Explain each one in brief. **10**
   (b) Consider the following segment table :– **10**

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses ?
(i) 0, 430, (ii) 1, 10, (iii) 2, 500, (iv) 3, 400, (v) 4, 112.

5. (a) What are the four conditions that create deadlock ? Explain deadlock prevention **10** and avoidance techniques.

   (b) Given five memory partitions of 100 kB, 500 kB, 200 kB, 300 kB, and 600 **10** kB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of 212 kB, 417 kB, 112 kB, and 426 kB (in order) ? Which algorithm makes the most efficient use of memory ?

6. (a) What are the various buffering techniques ? Explain each one in detail. **10**
   (b) Explain file allocation methods in details. **10**

7. Write a short notes on any **four** of the following :— **20**
   (a) Monolithic Vs. Micro Kernels   (d) NOS Vs. DOS
   (b) Comparison of any two RTOS   (e) Race Condition
   (c) V_x Works 5·X   (f) Inodes

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