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RN-7447

B. E. - IV (Sem. VII) (IT) Examination

May / June – 2010

Operating Systems (IT 703 IT)

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 4 (Sem. 7) (IT)**

Name of the Subject :

☛ **Operating Systems (IT 703 IT)**

☛Subject Code No. : **7 4 4 7** ☛Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer the two sections in separate answer books.
(3) Figures to the right indicate **full** marks.
(4) Make necessary assumptions and clearly mention them.

SECTION – I

Q.1 **(a)** **Do as Directed**

1. Define Spinlock. [1]
2. A soft real time system guarantees that critical tasks be completed on time . (True/ False) [1]
3. Define following: [1]
   - seek time
   - rotational latency
4. Define following: [1]
   - I/O bound process
   - CPU bound process
5. Draw diagram of many to one and one to many multithreading models [1]
6. Define race condition. [1]
7. Context switch time is pure overhead . true/ false. [1]
8. As process enters the system, they are put into a ready queue. True/False. [1]
9. We can view an operating system as a resource allocator. explain it [2]

(b) Explain : Multi-programmed System [4]

(c) Draw resource allocation graph for the following, where $P_i \rightarrow R_j$ signifies that process Pi requested an instance of resource Rj and Rj→ Pi signifies that an instance of resource type Rj has been allocated to process Pi. [4]

P={P1,P2,P3}

R={R1,R2,R3,R4}

E={P1→R1, P2→K3, R1→p2, R2→P2, R2→P1, R3→P3}

Resource instances:

One instance of resource type R1

Two instance of resource type R2

One instance of resource type R3

Three instance of resource type R4

Also comment on how to identify whether deadlock has occurred or not from resource allocation graph.

Q.2 (a) Explain Scheduling Criteria. Draw Gantt chart and also find out throughput, average turnaround time, average waiting time for the following process using shortest remaining time first algorithm. [8]

Process	Arrival Time	Processing Time
P1	0	5
P2	1	2
P3	2	5
P4	3	3

OR

(a) Explain message passing system and buffering in Inter-process communication. [8]

(b) Explain : Monitors [8]

(b) Write short note on Deadlock Prevention. [8]

Q.3 (a) Explain : Readers-writers problem [8]

(b) Explain following with diagrams: [8]
- process state
task control block

OR

(b) Discuss Banker's Algorithm. [8]

SECTION - II

Q. 4 (a) Answer the Following

1. The essential content(s) in each entry of a page table are? [1]
2. Define: Swap in, Swap out, Roll in, Roll out [3]
3. True/False: Logical address space is same as physical address space. [1]
4. Define: Thrashing. [2]
5. Define: Hit Ratio. [1]
6. Define: Internal and External Fragmentation. [1]

(b) Answer any ONE [5]

1. Given Partitions of 100k, 500k, 200k, 300k, 600k (in order) how would each of the first, best and worst fit algo. place the processes of 212k, 417k, 112k, and 426k (in order)? Which is using efficient memory?

2. Logical and physical address space.

Q.5 Attempt any TWO **[20]**

1. Explain Paging with example, protection and hardware model.
2. Directory structure.
3. Discuss RAID levels.

Q.6 Attempt Any Three **[15]**

1. MMU.
2. C LOOK, LOOK, SCAN, C SCAN.
3. File system Mounting and Partitioning.
4. Polling in IO system.
