OS Sem II 3227
Operating System 23/5/09

**Con. 2272-09.** **(Revised Course)** **BB-9204**

(3 Hours) **[Total Marks : 100**

**N.B. :** (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** out of remaining **six** questions.
(3) Assumptions should be made whenever **required** and should be **clearly** stated.
(4) Answers to questions should be **grouped** and written **together**.
(5) Draw the **diagrams** whenever **required**.

1. (a) For the processes listed below the table, draw Gantt chart and calculate Average waiting time and Average turn around time using :— **12**
   (i) FCFS (First come first serve)
   (ii) SJF (Shortest job first) in both conditions preemptive and non-preemptive
   (iii) Round-Robin (quantum = 2)

| Processes | Arrival Time(ms) | Burst Time(ms) |
|---|---|---|
| P1 | 0 | 8 |
| P2 | 0 | 4 |
| P3 | 1 | 6 |
| P4 | 2 | 1 |

   (b) Describe the differences among short-term, medium-term and long-term schedulers. **8**

2. (a) Suppose a disk drive has 400 cylinders, numbered 0 to 399. The driver is currently serving a request at cylinder 120 and previous request was at cylinder 140. The queue of pending request in FIFO order is :— **12**
   86, 147, 312, 91, 177, 48, 309, 222, 175, 130
   Starting from the current head position, what is the total distance in cylinders that the disk arm moves to satisfy all pending request for each of the following disk scheduling algorithm ?
   (i) SSTF (ii) SCAN (iii) C-SCAN
   (b) What is process ? Explain about five-state Process model in Process Management in detail. **8**

3. (a) What is virtual memory ? Explain paging technique in virtual memory. On a simple paging system with $2^{24}$ bytes of physical memory, 256 pages of logical address space and a page size of $2^{10}$ bytes, how many bits are in logical address ? **10**
   (b) What is thread ? Explain various kinds of threads in detail. **10**

**[TURN OVER**

4. (a) Consider following snapshot of a system :— 12

| Processes | Allocation | | | Max | | | Available | | |
|---|---|---|---|---|---|---|---|---|---|
| | R1 | R2 | R3 | R1 | R2 | R3 | R1 | R2 | R3 |
| P0 | 0 | 1 | 0 | 7 | 5 | 3 | 3 | 3 | 2 |
| P1 | 2 | 0 | 0 | 3 | 2 | 2 | | | |
| P2 | 3 | 0 | 2 | 9 | 0 | 2 | | | |
| P3 | 2 | 1 | 1 | 2 | 2 | 2 | | | |
| P4 | 0 | 0 | 2 | 4 | 3 | 3 | | | |

Using banker's algorithm answers the following :—

(i) What is the context of matrix need ?

(ii) Is the system in safe state ? Give the sequence.

(iii) If a request from process P1 arrives for (1, 0, 2) can the request be granted immediately ?

(b) Explain the difference between micro kernel and monolithic kernel architectures. Give examples of both type of operating system. 8

5. (a) What is deadlock ? What are the necessary conditions for occurrence of deadlock also mention the methods of handling deadlock ? 10

(b) Explain direct memory access (DMA) in detail with suitable example. 10

6. (a) Which different types of shells are available in UNIX ? Explain any five salient features of UNIX and also explain the architecture of UNIX. 10

(b) Discuss different methods of file access and also explain which one is the best access method. 10

7. Write short notes on any **four** :— 20

(a) Process Control Block (PCB)

(b) Buffering

(c) Semaphore

(d) Multiprogramming, Multitasking, Multiprocessing

(e) Context Switching

(f) Monitors.

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