ENGINEERING & MANAGEMENT EXAMINATIONS, DECEMBER - 2008

OPERATING SYSTEMS AND SYSTEM SOFTWARE

SEMESTER - 3

Time : 3 Hours] [Full Marks : 70

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) MS-DOS

a) does not support multiprogramming

b) supports multiprogramming to some extent

c) supports multiprogramming fully

d) none of these.

ii) Dijkstra's banking algorithm in an operating system, solves the problem of

a) deadlock avoidance b) deadlock recovery

c) mutual exclution d) context switching.

iii) Mutual exclution problem occurs between

a) two disjoint process that do not interact

b) processes that share resources

c) processes that do not share resources

d) none of these.

iv) Memory protection is of no use in a

a) single user system b) non-multiprogramming system

c) non-multitasking system d) none of these.

v) Dirty bit is used to show the

a) page with corrupted data

b) the wrong page in the memory

c) page that are modified after being loaded into cache memory

d) page that is less frequently accessed. ☐

vi) Fence register is used for

a) CPU protection b) memory protection

c) file protection d) all of these. ☐

vii) In Round-Robin CPU scheduling, as the time quantum is increased the average turn around time

a) increases b) decreases

c) remains constant d) varies irregularly. ☐

viii) Distributed systems should

a) meet prescribed time constraints

b) aim better resource sharing

c) aim better system utilization

d) aim low system overhead. ☐

ix) In real time operating system, which of the following is the most suitable scheduling scheme ?

a) Round-Robin b) First-come, first-served

c) Preemptive d) Random scheduling. ☐

x) In order to allow only one process to enter its critical section, binary semaphores are initialized to

a) 0 b) 1

c) 2 d) 3. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What do you understand by Short-term Scheduling and Long-term Scheduling of process ? 3

   b) What is swapping ? 2

3. a) What is critical-section problem ? $2\frac{1}{2}$

   b) How to solve critical-section problem ? $2\frac{1}{2}$

4. a) Define Deadlock. 1

   b) What are the necessary conditions to arise deadlock and why ? 4

5. Define External Fragmentation and Internal Fragmentation. 5

6. a) What is Domain of protection ? $2\frac{1}{2}$

   b) What is Access Matrix ? $2\frac{1}{2}$

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. $3 \times 15 = 45$

7. What is process ? What is PCB ? Discuss various process states with state transition diagram. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds :

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	5
P4	1	4
P5	5	2

All are arrived at the same time in the above order from P1 to P5.

Draw the Gantt charts illustrating the execution of these processes using FCFS, SJF and Priority scheduling.

Also find out the average waiting time for all the cases. $1 + 2 + 4 + 8$

8. a) What is the difference between logical address and physical address ? 4

b) What is compaction ? What are the drawbacks of compaction ? 1 + 2

c) Compare between paging and segmentation. 3

d) Explain demand paging. 5

9. Write short notes on the following 5 × 3

a) Thrashing

b) Dynamic partitioning

c) Banker's algorithm

d) Scanning and Pursing (Lexical and Syntactic Analysis)

e) Thread.

10. a) What is the role of a compiler ? Diagramatically represent its different phases.

b) What is the role of an assembler. Compare and contrast pass 1 and pass 2 assemblers. (2 + 4) + (2 + 7)

11. a) Briefly discuss Remote Call Procedure (RPC) mechanism.

b) Explain, how does IPC take place ? 9 + 6

END