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Question Paper Code : 75598

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fourth Semester

Software Engineering

XSE 242/10677 SW 403 — OPERATING SYSTEMS AND SYSTEM SOFTWARE

(Regulation 2003/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of using macro definitions in a program?

2. What is cross-assembler?

3. What are co-operating processes?

4. What are the two models are of inter process communication?

5. What is a semaphore?

6. What is a multithreaded process?

7. State the four necessary conditions for the deadlock to occur.

8. What is paging?

9. What is thrashing?

10. What is sector sparing?

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail the various phases of two-pass assembler.   (16)

Or

(b) Describe in detail the design of a macro preprocessor with an example.   (16)

12. (a) (i) Define the essential properties and the types of multiprocessor system. (8)

       (ii) Distinguish between client-server and peer-to-peer models of distributed systems. (8)

Or

(b) Describe the various states of a process and the actions taken by CPU to context switch between processes. (16)

13. (a) (i) Describe in detail the various types of multithreaded model. (8)

       (ii) Explain in detail the Reader-Writer classic problem of synchronization. (8)

Or

(b) Consider the following set of processes, with the length of the CPU burst given in milliseconds.

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

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

       (i) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non preemptive priority (a smaller priority number

           implies a higher priority) and RR (quantum =1). in part a? (4)

       (ii) What is the turnaround time of each process for each of the scheduling algorithms in part a? (4)

       (iii) What is the waiting time of each process for each of the scheduling algorithms in part a? (4)

       (iv) Which of the algorithms in part a results in the minimum average waiting time (over all processes)? (4)

14. (a) Explain in detail any two deadlock avoidance algorithms. (16)

Or

(b) (i) Describe the paged-segment memory management schemes in detail. (8)

       (ii) Explain in detail the hierarchical paging scheme of structuring the page table. (8)

15. (a) (i) Explain in detail the layered file system structure. (8)

       (ii) Describe in detail the FIFO page replacement algorithm. (8)

<div align="center">Or</div>

  (b) (i) Discuss in detail the directory structure. (8)

       (ii) Describe in detail the LRU page replacement algorithm. (8)

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