21/5/13 AN
L 13

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 65080

5 Year M.Sc. DEGREE EXAMINATION, MAY/JUNE 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 is assembler?

2. Define macro expansion. Give an example.

3. What is feature migration?

4. Write the operations of process.

5. Mention the criteria of scheduling.

6. What is critical region?

7. Mention the main difference between deadlock prevention and deadlock avoidance.

8. List the uses of swap in and swap out.

9. Define virtual memory.

10. Give the structure of directory.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the elements of assembly language programming. (16)

Or

(b) Explain the design of a two pass assembler in detail. (16)

12. (a) (i) Explain distributed and clustered systems briefly. (10)

(ii) Write the concepts of process. (6)

Or

(b) (i) Write short note on feature migration. (6)

(ii) Discuss the different mechanisms to handle interprocess communication. (10)

13. (a) Consider the following set of processes, with the length of the CPU - burst time given in milliseconds:

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	5
P_4	1	4
P_5	5	2

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5, all at time 0.

(i) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, nonpreemptive priority (a smaller priority number implies a higher priority), and RR (quantum =1). ($4 \times 2 = 8$)

(ii) What is the turnaround time of each process for each of the scheduling algorithms in part (i)? (3)

(iii) What is the waiting time of each process for each of the scheduling algorithms in part (i)? (3)

(iv) Which of the algorithms in part (i) results in the minimum average waiting time (over all processes)? (2)

Or

(b) (i) Discuss about readers-writers problem with their structure. (8)

(ii) Explain how to solve dining-philosophers problem using monitors. (8)

14. (a) (i) Explain why segmentation and paging are sometimes combined into one scheme. (6)

(ii) Discuss about contiguous memory allocation in detail. (10)

Or

(b) Describe the general strategy behind deadlock avoidance and deadlock detection in detail. (16)

15. (a) Consider the following page reference string:

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 four, five and seven frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each. Use LRU replacement and FIFO replacement algorithms and compare the results. (16)

Or

(b) What is thrashing? How might it be detected? How might one recover from it once detected? Explain. (16)