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Question Paper Code : 75486

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

Fourth Semester

Software Engineering

ESE 042 — OPERATING SYSTEM AND SYSTEM SOFTWARE

(Regulation 2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between syntax and semantics.
2. How does macro differ from subroutine call?
3. What is Spooling in relation to operating systems? Differentiate between short term and long term scheduler.
4. What are the criteria on which CPU scheduling done?
5. What is race condition?
6. Give the sufficient condition for a dead lock to occur.
7. Give the relationship between page and a frame.
8. What is Balady's anomaly?
9. Define temporal locality of reference.
10. What is virtual memory?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare and contrast single and two pass assemblers. (12)

(ii) Give an outline algorithm for macro expansion. (4)

Or

(b) (i) Explain a single assembly scheme with its different phases using proper example and illustrations. (10)

(ii) What is aparse tree? Differentiate between TOP down parsing and bottom up parsing. (6)

12. (a) Give a short history of the evolution of the operating systems. (16)

Or

(b) Give in detail, the various inter–process communication techniques. (16)

13. (a) (i) Give the average waiting time and average turn around time for the following processes, if shortest remaining job first, and round robin with time slice = 4 are used. (8)

Process No.	Arrival Time	Next CPU burst
1	0	6
2	3	4
3	4	2

(ii) What will happen, if the time slice in round robin is increased/decreased very much? (4)

(iii) 'FCFS and shortest job first are also priority scheduling'. Yes or No? Justify your answer. (4)

Or

(b) (i) Explain critical section problem. What are the criteria to be fulfilled by any solution to a critical section problem? Give Peterson's solution for the critical section problem and show that it fulfills all the required criteria. (8)

(ii) Give a solution to the reader's Writers problem. Is read count in this solution protected by a mutual exclusion construct? Explain why should it be so. (8)

14. (a) (i) Differentiate clearly between deadlock prevention and deadlock avoidance. Give a method as to how circular wait can be avoided while allowing hold and wait. Prove that it works. (12)

(ii) Give the resource request algorithm. (4)

Or

(b) (i) What is the idea behind dynamic memory allocation in memory management? What approach should be taken for address binding in such a situation, especially when compaction is resorted to solve external fragmentation. (12)

(ii) Differentiate clearly between external and internal fragmentation. Explain with an example. (4)

15. (a) (i) Explain the working window method of allocation of frames. (10)

(ii) What is thrashing? Explain how it sets in. What is the solution for that? (6)

Or

(b) (i) What are the different possible directory structures? Discuss their advantages and disadvantages. (12)

(ii) What are the different file protection methods operating system can enforce? (4)

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