

III B.Tech. I Semester Regular Examinations, November -2005
OPERATING SYSTEMS AND SYSTEMS PROGRAMMING
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) State the objectives of an operating system. [2]
(b) Brief the functions of an operating system. [6]
(c) Explain the various phases in the evolution of operating system concepts. [8]
2. (a) Explain how multiprogramming helps improve CPU utilization. [6]
(b) Differentiate -process and program. [4]
(c) Draw the diagram for process control block [6]
3. (a) Explain the root-cause for CSP (Critical Section Problem). [4]
(b) Write about the hardware solution with suitable example. [12]
4. Write and compare the Bankers' and Detection algorithms (Deadlocks). [16]
5. (a) Explain the logical memory concept used in paging [6]
(b) With a neat hardware diagram, explain the paging concept. [10]
6. (a) Explain the problem of Compaction. Mention a means for its elimination.
(b) What are the various options for accommodating a file in free segments using Contiguous disk file-allocation method. [8+8]
7. (a) Name the various data structures and databases used in the 2-pass assembler.
(b) Explain the purpose of data structures and databases in detail. [6+10]
8. (a) What is meant by a macro and macro processor? [8+8]
(b) Distinguish the terminology: Macro definition, Macro call, Macro expansion.

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1. (a) State whether the concepts, multiprogramming and timesharing, are realizable without the other. Justify [8]
(b) Brief the features of Windows 2000 OS. [8]
2. (a) State the criteria for evaluation of CPU scheduling algorithms
(b) Compare and contrast multi-queue CPU scheduling algorithms (with and without feedback) [12+4]
3. (a) Whether concurrency has significance in uniprocessor environments? Justify your answer. [6]
(b) State and explain the Bernstein's concurrency conditions with examples. [10]
4. (a) What are the different methods for managing deadlocks? [6]
(b) Explain how deadlocks are *prevented*. [10]
5. (a) List the various memory management schemes. [6+10]
(b) Compare the memory management approaches in Linux and Windows 2000.
6. (a) Explain the typical operations performed on a file and a directory. [6]
(b) Write about Acyclic Graph-Structured file-directory structure. [10]
7. What is meant by assembling? Explain the various elements of assembly language programming through a simple assembly program [16]
8. (a) Explain the terms- macro and macro processor. [8+8]
(b) List and brief the advanced macro features.

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1. (a) State the components of a computing system. [2]
(b) Justify the naming of operating system as control program [4]
(c) List the various mechanisms in the evolution of operating system, giving only the merits and demerits of each. [8]
2. (a) Distinguish a program from a process. (2M)
(b) Write about Process Control Block (PCB) (8M)
(c) Draw the process state diagram (6M)
3. (a) What is a resource allocation graph? State the necessary and sufficient conditions for deadlock formation. [6]
(6+10)
(b) Explain how the circular wait condition can be exploited to prevent deadlocks.
4. (a) Write the deadlock detection algorithm. [10]
(b) Illustrate the above algorithm by taking a typical snapshot of a system [6]
5. (a) Draw the hardware diagrams (ONLY) of Paging and Segmentation. [10]
(b) Discuss alternatives for *pagetable* implementation. [6]
6. Compare and contrast the file-directory implementation techniques-Tree-Structured, and Acyclic Graph Structured. [16]
7. (a) Name the various data structures used in the first pass of the 2-pass assembler.
(b) Draw the flowchart (only) for second pass of the 2-pass assembling. [6+10]
8. (a) What is meant by a macro and macro processor? [8+8]
(b) Distinguish the terminology: Macro definition, Macro call, Macro expansion.

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1. (a) Distinguish the following terminology: [4x3]
 - i. Uniprogramming and multiprogramming
 - ii. Uniprocessing and multiprocessing
 - iii. Unitasking and multitasking
 - iv. Unithreading and multithreading
- (b) Distinguish batch-processing and time-sharing operating systems. [4]
2. Compare and contrast the preemptive and non-preemptive SJF scheduling algorithms. [16]
3. (a) List the specification means of concurrent programs. [2]
- (b) Write about any one in detail with illustrative examples, giving advantages and disadvantages. [14]
4. (a) Write the Bankers' algorithm. [10]
- (b) Illustrate the above algorithm by taking a typical snapshot of a system. [6]
5. (a) Draw the hardware diagrams (ONLY) of Segmentation and. Paging [10]
- (b) Discuss alternatives for segment table implementation. [6]
6. (a) Explain the terms: file, file structure, file directory, and physical directory. [10]
- (b) State the operations performed on a file and directory. [6]
7. Explain the design of a single pass assembler in detail, giving format of all the data structures used. [16]
8. (a) Explain the concept of Loading. [6]
- (b) Brief the concept of Linking [6]
- (c) Write about relocation briefly. [4]
