BT-4/M-20   **34124**
OPERATING SYSTEMS
IT-208N

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least question from each Unit. All questions carry equal marks.

Unit I

1. (a) Identify and explain the roles of the following :

(i) Process states   **3**

(ii) Process hierarchies   **3**

(iii) Context switching.   **3**

(b) Elaborate the roles of interrupts in operating systems. Discuss the technicalities of using various interrupts mechanisms in operating systems.   **6**

2. (a) Explain the following CPU scheduling algorithms :   **3+3+3**

(i) SJF   (ii) FCFS

(iii) Round Robin.

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(b) What are the prime objectives of using scheduling ? How does pre-emptiveand non-premptive scheduling work ? Briefly explain each of them.

Unit II

3. (a) Explain and justify the roles of the following :
   (i) Producer-consumer problem **4**
   (ii) Banker's algorithm. **4**
   (b) Write and explain the Dining Philosophers Problem. Also, provide the solution for this problem using semaphores. **7**

4. (a) Definethe deadlockstatesExplainthe scientific procedures of the following : **3+3**
   (i) Deadlock Recovery
   (ii) Deadlock Prevention.
   (b) Why monitorsand messagepassingmechanisms are valuablein any type of inter-process communication **5**
   (c) Explain and substantiate the concept of interprocess communication in operating systems. **4**

Unit III

5. (a) Write short notes on the following :
   (i) Demand Paging **3**
   (ii) Disk Space Management. **3**
   (iii) File protection using access control, security and authorization. **3**

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(b) What is a page-fault ? List all the steps of how a page-fault is serviced by the operating system ? **6**

6. (a) Explain the following security models :
    (i)   Mandatory Access Control   **3**
    (ii)   Rule Based Access Control   **3**
    (iii) Discretionary Access Control.   **3**

(b) Explain the concept of Virtual Memory. List and explain any *one* method for implementation.

Unit IV

7. (a) Justify the role of using buffering. How can it be used for an effective management of various devices ?   **8**

(b) Draw and explain the flow of activity that takes place during a remote procedure call (RPC) between two networked systems.   **7**

8. (a) Recognize the importance for employing dedicated devices and shared devices under device management.   **8**

(b) What is basic role of software and hardware in the security of distributed file systems ? How will the distributed file systems be protected from an unauthorized use and virus attacks.   **7**