

AE-1313

B.C.A. (Part - II)

OPERATING SYSTEM

Time : Three Hours] [Maximum Marks : 100
[Minimum Pass Marks : 33

Note : Answer **all** questions. There is internal choices in each Unit. The figures in the right-hand margin indicate marks.

1. Answer the following short answer type questions : $2\frac{1}{2} \times 10$
- (a) Define Operating System.
 - (b) Explain batch operating system.
 - (c) What is inter-process communication ?
 - (d) What is Semaphore ?
 - (e) What is Paging ?
 - (f) Define Thrashing.
 - (g) What is virtual memory ?

(2)

- (h) What do you mean by directory ?
- (i) Define Monitor.
- (j) Explain critical section problem.

Unit-I

2. What is process ? Explain process state diagram in detail. 15

OR

Explain the following :

- (a) Operating system as a resource manager
- (b) Distributed operating system

Unit-II

3. What do you mean by deadlock avoidance ? Explain Banker's algorithm with suitable example. 15

OR

Explain the classical problems of synchronization in detail.

Unit-III

4. What is Segmentation ? Explain segmentation with paging. 15

OR

(3)

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 three frames ? Assume that all frames are initially empty, so your first unique pages will cost one fault each.

- (a) LRU (Least Recently Used) replacement
- (b) FIFO (First-In-First-Out) replacement
- (c) Optimal replacement

Unit-IV

5. Explain the techniques for device management. 15

OR

Explain the following :

- (a) Buffering
- (b) Disk Structure

Unit-V

6. Explain the following : 15
- (a) Logical File system

(4)

(b) Directory Implementation

OR

Explain the free-space management in detail.
