(Please write your Exam Roll No.) Exam Roll No. 0032140213

END TERM EXAMINATION

FIFTH SEMESTER [BCA] DECEMBER 2015

Paper Code: BCA-301 Subject: Operating Systems (Batch: 2011 onwards)

Time: 3 Hours Maximum Marks: 75

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

(5x5=25)

Q1
(a) Define race condition with an example.
(b) What is dead-lock? List the necessary conditions for a deadlock to occur.
(c) Define starvation in a deadlock situation with an example.
(d) Briefly how starvation is avoided in the operating system.
(e) Give four general examples of the use of threads in a single-user multiprocessing system.

UNIT-I

Q2 (a) What are deadlock prevention techniques? What do you mean by deadlock avoidance? (5)
(b) What is dining philosopher problem? Provide solution to solve the dining philosopher problem. (7.5)

Q3 (a) What is semaphore? Describe how semaphore can be used for block wake up synchronization between processes. (5)
(b) Given a total of 10 units of a resource type, and given the sage state shown below, should process 2 be granted a request of 2 additional resources? Justify your answer whether the new state is safe or unsafe state. (7.5)

Process	Used	Max
P1	2	5
P2	1	6
P3	2	6
P4	1	2
P5	1	4

UNIT-II

Q4 (a) What is Critical-Section problem? What are the requirements that critical-section problem must satisfy for its solution? (5
(b) Describe the need for Device management. Explain techniques used for managing and allocating devices. (7.5

Q5 (a) What is an operating system? Discuss the main services of operating system and also discuss the purpose of system calls in operating system. (5
(b) What is the goal of multiprogramming? Differentiate between a time sharing system and real time system. (7.5

UNIT-III

Q6 (a) What is process control block (PCB)? Explain various states of a process with suitable diagram. (5
(b) What are cooperating processes? Explain message passing method for achieving inter-process communication (IPC) with suitable diagram. (7.5

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P.T.O.

7 (a) What are multiprocessor systems? List their advantages and explain different types of multiprocessor systems. (5)

(b) What resources are typically shared by all the threads of a process? List reasons why a mode switch between threads may be cheaper than a mode switch between processes. And also differentiate between user level threads and kernel level threads. (7.5)

UNIT-IV

8 Consider that the pages are referenced in the following sequence (12.5)
0,9,0,1,8,1,8,7,8,7,1,2,8,2,7,8,2,3,8,3.

How many page faults would occur for the following page replacement algorithm with three page frames?

(a) FIFO
(b) Optimal
(c) LRU

(6.25x2=12.5

Write a short note on:

(a) Swap space management
(b) Risk reliability