

Seat No. : _____

DC-111

December-2013

5 Years M.Sc. (CA & IT) Integrated (K.S.) 3rd Sem. S.Y. M.Sc.

Concepts of Operating System

Time : 3 Hours]

[Max. Marks : 100

1. (A) Answer any **three** : 12
- (1) Draw & explain instruction cycle with interrupt.
 - (2) What are the steps involved in process switching ?
 - (3) Explain simple batch systems and multi-programmed batch systems.
 - (4) What are the reasons of process creation ? List any 4 reasons for process termination.
- (B) Draw and explain process state transition diagram with two suspend states. 8
2. Answer any **four** : 20
- (1) Write a short note on monitor.
 - (2) Give solution to bounded buffer producer consumer problem using semaphore.
 - (3) Explain how deadlocks can be prevented
 - (4) What is a semaphore ? Give definition of binary semaphore primitive.
 - (5) What are the necessary & sufficient conditions for deadlock to occur ? Name the approaches used for deadlock avoidance.
3. Answer any **four** : 20
- (1) Write a short note on fixed partitioning.
 - (2) Explain inverted page table.
 - (3) Explain address translation in virtual memory segmentation system.
 - (4) Explain the fetch policy & cleaning policy of operating system for virtual memory.
 - (5) Suppose the OS on your computer uses the buddy system for memory management. Initially the system has 1 megabyte block of memory available. Show the result of each request / release via successive figures :
- (A) Request 100 K
 - (B) Request 400 K
 - (C) Request 60 K, Release A
 - (D) Request 200 K, Release C, Release D, Release B

4. (A) Answer any **two** : **10**
- (1) What is multithreading ? Draw the diagram of multithreaded process model. What are the advantages of using threads ?
 - (2) Which are the different file allocation methods ? Explain any one.
 - (3) Differentiate between :
 - (i) ULT & KLT
 - (ii) Simple Paging & Simple Segmentation

- (B) Apply FCFS, Round robin [q = 3], SPN & HRRN for the following information. Also calculate the turn around time : **10**

Process	Arrival Time	Service Time
A	0	4
B	3	2
C	5	5
D	8	3

5. Answer the following : (any **four**) **20**
- (1) Explain the evolution of I/O functions.
 - (2) Briefly explain different techniques used for free space management.
 - (3) Explain file system architecture.
 - (4) Explain frequency based replacement algorithm used for disk cache.
 - (5) Consider the following sequence of disk track requests :
35, 128, 150, 70, 41, 162, 30, 185.

Assume that the disk head is initially positioned over track 110 and is moving in the direction of decreasing track numbers. Show the next track accessed by FCFS, SSTF, SCAN & C-SCAN.
