5/12/16

No. of Printed Pages: 2

Roll No._____

DOON UNIVERSITY, DEHRADUN

End Semester Examination,December-2016

MCA (Integrated): STM-520[Operating Systems]
MSc CS (Integrated): CSC-203[Operating Systems]
SEMESTER-III

Time Allowed: 3Hours *Maximum Marks: 50*

Note:*Question paper is divided into three sections A, B & C. Attempt all questions. Marks distribution is given alongside.Follow the instruction as given in each section.*

SECTION: A

Que-1 **[Marks: 4*1=04]**

a) List out the necessary condition for Deadlock.
b) List out at-least 3 Classical Problems of Process Synchronization.
c) List the requirements that a solution to critical section problem should meet?
d) List any four example of Deadlocks which is not related to computer systems.

Que-2 **[Marks: 2*3=06]**

a) Explain Internal and External fragmentation, associated problems with suitable example.
b) Explain different disk space allocation methods.

SECTION: B

[Marks: 5*4=20]

Que-3 What is Context Switching? Demonstrate the usage of PCB in case of context switching for two processes P_0 and P_1

Que-4 Suppose that a disk has 50 cylinders named 0 to 49. The R/W head is currently serving at cylinder 15. The queue of pending requests are in order: 4 40 11 35 7 14 starting from the current head position, what is the total distance traveled (in Cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF and LOOK. Illustrate with figure in each case.

Que-5 What is the cause of thrashing? How does system detect thrashing?

Que-6 Consider the following set of processes.

Process	Burst Time	Arrival Time	Priority
P1	10	0	2
P2	5	2	1
P3	2	3	0
P4	20	5	3

Draw Gantt charts and calculate average waiting time, average turnaround time using following CPU scheduling algorithms.

i) Preemptive shortest Job First.

ii) Non preemptive priority (Assume 0=HIGH Priority)

Que-7 Discuss how Readers-Writers Problem can be solved by using Semaphores.

SECTION: C

Que-8 **[Marks :2*5=10]**

a) What is Paging? Explain.

b) What is critical section problem? How does a semaphore solve the critical section problem?

Que-9 **[Marks :1*10=10]**

Consider the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 3, 6. How many page faults would occur for the following page replacement algorithms assuming 3 and 5 frames.

i) LRU **ii)** Optimal