

BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHIBPUR
M.E. 1ST SEMESTER (IT) FINAL EXAMINATIONS, 2012
Design of Operating System (ICE 904/4)

Full Marks: 70

Time: 3 hrs

Answer any five questions.

- Q1. a) Explain when Selfish Round Robin scheduling behaves like i) FCFS and ii) RR scheduling algorithm. [2+2]
b) Show that in lottery scheduling a client's average response time is inversely proportional to ticket allocation. [4]
c) Explain the concept of ticket compensation used in lottery scheduling. [4]
d) Explain the different measures taken in Windows scheduling to make it user friendly. [2]
- Q2. a) How can you recover a failed disk in RAID level 1? Write down the steps. [3]
b) Why RAID level 2 is rarely used? State its disadvantages. [3]
c) Explain how data striping can improve the data transfer rate. [3]
d) Is it possible to achieve parallel writes in RAID 4? Justify. [3]
e) State one advantage of RAID 6 over RAID 5. [2]
- Q3. a) State the primary difference between UMA and NUMA. [4]
b) What is attraction memory? [3]
c) Describe two different ways of achieving cache coherence in UMA. [4]
d) State how you can achieve cache coherence in CC-NUMA. [3]
- Q4. a) State the advantages and disadvantages of SMP multiprocessor scheduling. [4]
b) Write a short note on gang scheduling. [4]
c) Write the different steps of process migration. [4]
d) What is dirty eager migration? [2]
- Q5. a) Suppose a page is valid but not in main memory, then how is it indicated in the page table? [3]
b) State and illustrate the clock page replacement algorithm with an example. [4]
c) For a given inode number i , how can you find the block number and the byte offset when n is the number of inodes per block and z is block size? [4]
d) In the algorithm *iput*, what are the actions taken when the inode link count is zero? [3]
- Q6. a) Write the disadvantages of buffer cache. [3]
b) Give a brief outline of the algorithm *open* which takes a file name as an input and outputs the file descriptor. [4]
c) What is the basic difference in the algorithms in reading a pipe and a file? [3]
d) In the *write* system call, the inode is locked for the duration of the write, why? [2]
e) In the *read* system call, the inode is locked, why? [2]