POKHARA UNIVERSITY

Level: Bachelor | Semester – Spring | Year : 2015
Programme: BE | Full Marks : 100
Course: Operating System | Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is the difference between kernel mode and user mode? Why is the difference important to an operating system? 7
   b) "OS' is simply considered as Resource manager as well as Virtual machine", Why? Explain in your own words. 8
2. a) Define process. Why different process states are essential in multiprogramming? Justify with an example. 5
   b) Why mutual exclusion is required in multiprogramming? Explain with an example of an appropriate race condition case. 5
   c) What is the difference between deadlock and starvation? What are the strategies used to solve the problem of deadlock? 5
3. a) What are the advantages and disadvantages of using the same systemcall interface for manipulating both files and devices? 6
   b) Consider the following set of processes, along with their burst time (in milliseconds), arrival time and priorities. Calculate average waiting time and average turnaround time using following scheduling, Also describe which one is best algorithm and why. 9
      i. FCFS
      ii. SJF
      iii. Priority (Preemptive)
      iv. RR (Quantum size=1ms)

Process	Arrival Time	Burst Time	Priority
P_1	0.0	8	2
P_2	0.4	4	1
P_3	1.0	1	3
P4	0.0	8	4

4. a) What is a TLB? How does the TLB map virtual and real addresses? Explain with mapping diagram? 8
   b) Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order), how would the first-fit, best fit and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory? 7

5. a) What is RAID? Explain Levels of RAID with suitable diagram. 8
   b) What is a file? Explain different file allocation techniques in OS. 7
6. a) What is the distributed operating system? Explain Remote Procedure Call (RPC) with the help of an appropriate figure. 7
   b) Why distributed system is growing rapidly than centralized system? Give reasons. What are the advantages and disadvantages of a distributed operating system? 8
7. Write short notes on **(Any Two)**: 2x5
   a) Amoeba System Architecture
   b) DOS
   c) Device Controllers