# POKHARA UNIVERSITY

Level: Bachelor      Semester: Spring      Year   : 2017
Programme: BE                                     Full Marks: 100
Course: Operating System                    Pass Marks: 45
                                                   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) Define operating system. Explain monolithic and layered structure of operating system.    8

   b) Define process. Differentiate between process and program.    7

2. a) Explain difference between thread and process? Explain different multithreading model?    7

   b) What make message passing IPC as one among the best method of IPC implementation? Explain with pseudo code details.    8

3. a) Explain necessary and sufficient condition for deadlock. Give an algorithm for deadlock detection for a system with multiple resource of same kind.    8

   b) Consider the Dining Philosophers problem with n philosophers but with n+1 forks; the extra fork is in the middle of the table and can be used by any philosopher(but only by one of them at a time), Is deadlock possible? Explain your answer.    7

4. a) Define context switching (kernel mode and user mode).    3

   b) Consider 5 processes P1, P2, P3, P4, and P5 which arrives at time 2, 6, 4, 5 and 0 units to the waiting queue. And burst time of processes are 8, 4, 6, 8, 4 units respectively. Find throughputs of the following algorithms;    7

      i. HRRN
      ii. Round Robin
      iii. SRT

   c) Define term thrashing and pre-paging. Explain Working set page replacement Algorithm with example.    5

5. a) Given below is the references made to the following pages by a    8

program: 1,3,2,3,4,5,3,2,5,1,4,3,2,4,3,5,1,6,3,4,0,3,2 Show the successive pages residing in the four frames using replacement policy below. Also, state how many page faults will occur for each of the Replacement policies and calculate the fault rate.

   i.   FIFO

   ii.   NRU

   iii.   optimal

b) The disk track requests are: 123, 250, 298, 120, 13, 300 and 224. Assume that the last request is at track 150 and the head is moving towards track 0. Find out the total seek Time for each of the disk scheduling algorithms below:     7

   i.   SSF

   ii.   C-SCAN

   iii.   FIFO

6. a) With help of necessary diagram, explain file system allocation techniques.     5

   b) Define Distributed Operating System. Explain the similarity and dissimilarity between TCP/IP and OSI Network Architecture.     5

   c) Differentiate between Linux and UNIX. Explain memory management technique in Linux.     5

7. Write short notes on: (**Any two**)     2×5

   a) Flynn Taxonomy

   b) Security in windows 2000

   c) DMA