POKHARA UNIVERSITY

Level: Bachelor   Semester: Fall   Year   : 2018
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) What is an operating system? Explain the concept-"OS as a resource   8
   manager and OS as an extended machine."
   b) What is the problem associated with sleep and wake up based   7
   solution for achieving mutual exclusion? Explain how monitor
   overcomes this problem?

2. a) Differentiate between deadlock and starvation. For resources type   8
   with multiple instances, we can model resource allocation and
   requests as a directed graph connecting processes and resources.
   Explain the step involved in deadlock detection taking such graph as
   an example.
   b) Define process. Explain process control block (PCB) and explain   7
   process states and its transition.

3. a) What do you mean by thread? Differentiate between user level and   8
   kernel level threads.
   b) Explain the difference between internal and external fragmentation.   7
   How external fragmentation can be combat, illustrate with example.

4. a) Consider the following set of processes that arrives at time 0, with   8
   the length of the CPU burst given in milliseconds: Construct Gantt
   chart and calculate average waiting time.

Process	Burst Time	Priority
P₁	30	2
P₂	7	6
P₃	5	1
P4	18	3
P5	5	5
P6	8	4

     i.   Round Robin (quantum = 5)
     ii.   Priority Scheduling (1 highest priority)
     iii.   FCFS
     iv.   Shortest job first

   b) How does DMA assist CPU in concurrent processing? Illustrate   7
   with block diagram.

5. a) What is page fault? Consider the following page reference strings: 8
   1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page
   faults would occur for each of the following page replacement
   algorithms assuming 3 pages a frame? In each case calculate fault
   ratio.
     i.   FIFO page replacement
     ii.   LRU page replacement
     iii.   Optimal page replacement
   b) How files and directories are stored in memory such that they can   7
   be managed efficiently? Explain the approaches.

6. a) What RPC? Show the operation of RPC in a client server computing   7
   environment taking an example and a necessary figure.
   b) Explain about file and disk management in Windows 2000.   8

7. Write short notes on: (**Any two**)   2×5
   a) Interrupt Handler
   b) Autoexec. bat and Config. sys files in MS-DOS
   c) Group Communication