POKHARA UNIVERSITY

Level: Bachelor	Semester – Spring	Year: 2020
Programme: BE		Full Marks : 70
Course: Applied Operating System		Time: 2 hrs.

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.

Group –A: (5×10=50)

1. System calls are important for Operating System to perform. Justify your views. Explain different categories of system calls with example.

   OR

   Differentiate between interrupt driven i/o and Programmed i/o and DMA(Direct Memory Access).

2. Is semaphores can be used for achieving mutual exclusion? How? Explain solution to producer-consumer problem using semaphores.

3. A system has three types of resources R1 R2 R3 and their number of units are 3, 2, 2 respectively. Four processes P1 P2 P3 p4 are currently competing for these resources in following number.
   1. P1 is holding one unit of R1 and is requesting for one unit of R2.
   2. P2 is holding two units of R2 and is requesting for one unit each of R1 and R3.
   3. P3 is holding one unit of R1 and is requesting for one unit of R2.
   4. P4 is holding two units of R3 and requesting for one unit of R1.

   Determine which if any of the processes are deadlock in this state.

4. Is page fault is good for OS? Justify your views. How many page faults occur for the following reference strings for 3 page frames:

   8, 1, 9, 5, 4, 8, 5, 3, 6, 3, 8, 1, 9, 5, Using LFU, Second Chance, and Optimal page replacement algorithm.

5. Suppose the following request queue(in order): 73, 173, 24, 109, 11, 121, 59, 63 with the head initially at track 35 and the trail track being at 179. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithms?
   i. FCFS
   ii. SSTF
   iii. SCAN(initially moving downward)
   iv. C-SCAN(initially moving upward)
   v. LOOK

Group –B (1×20=20)

6. Consider the following set of processes along with their burst time(in ms), arrival time(in ms). Determine the average waiting-time and average turn-around time using SJF(preemptive), RR (Quantum = 2) ,HRRN and FCFS. Which algorithm is best.

Process	Arrival Time	Service Time (Burst Time)
P1	0	4
P2	4	7
P3	6	5
P4	7	6

What are points to be consider in file system design? Differentiate between linked list allocation, index allocation and contiguous allocation in file system.