POKHARA UNIVERSITY

Level: Bachelor | Semester: Spring | Year : 2019
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 are System Calls? Explain the types of System Calls. Explain the sequence of System Calls for copying one file to a new file. 8
   b) Explain the process state transition diagram used in multiprogramming environment. Describe the fields in a process control block (PCB). What is switching overhead? 7

2. a) State Producer Consumer problem. Explain how to solve it. 8
   b) How can Mutual exclusion affect program performance? Describe sleeping barber problem with pseudo codes. 7

3. a) Why is deadlock state more critical than starvation? Describe resource allocation graph with a deadlock, with a cycle but no deadlock. 8
   b) Explain about the types of kernels. 7

4. a) From the following set of information, Find the average waiting time and average turn-around time using FCFS, SJF, RR (Quantum = 3) and HRRN. 8

Process	Arrival Time	Service Time (Burst Time)
A	0	7
B	2	6
C	4	8
D	7	5
E	9	4

   b) Explain the sequence of events during remote procedure call using an example; also explain why remote procedure call (RPC) doesn't fit in OSI model. 7

5. a) Explain the concept of Thrashing. Suggest ways to prevent it. 7

b) Consider the following page reference strings: 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. 8

i) Second Chance page replacement

ii) LRU page replacement

iii) FIFO page replacement

6. a) Suppose a disk drive has 400 cylinders , numbered 0 to 399.The driver is currently serving a request at cylinder 143 and previous request was at cylinder 125 .The queue of pending request in FIFO order is: 86, 147, 312, 91, 177, 48, 309, 222, 175, 130. Starting from the current head position what is the total distance in cylinders that the disk to satisfy all the pending request for each of the following disk scheduling algorithms? 8

i) SSTS ii) SCAN iii) C-SCAN

b) How files can be allocated using Linked list and I-Node method? Describe using appropriate figures. 7

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

a) ATM

b) Internal and External Fragmentation

c) HRN Scheduling