Tribhuvan University
Institute of Science and Technology
2081
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Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSC 264)
(Operating Systems)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
All figures in the margin indicate full marks.

Section A

Long Answer Questions.
Attempt any **TWO** questions. **[2 × 10 = 20]**

1. Explain the translation of logical address into physical address using segment table with necessary diagram. List advantages and disadvantages of segmentation. [6+4]
2. Find the seek time using SCAN, C-SCAN, Look and C-Look disk scheduling algorithm for processing the following requests queue: [10]
   35, 70, 45, 15, 65, 20, 80, 90, 75, 130. Suppose the disk has tracks numbered from 0 to 150 and assume the disk arm to be at 30 and moving outward.
3. Explain Sleeping Barber problem. Illustrate on how it can be solved. [5+5]

Section B

Short Answer Questions.
Attempt any **EIGHT** questions. **[8 × 5 = 40]**

4. Explain microkernels and exokernels. [5]
5. Consider a swapping system in which memory consists of the following hole sizes in memory order 15 MB, 2 MB, 10 MB, 6 MB, 8 MB and 20 MB. Which hole is taken for successive segment requests of [5]
   a) 6 MB
   b) 10 MB
   c) 8 MB

   for first fit, next fit and best fit.
6. Explain how semaphore solves the problem of critical section? [5]
7. How do you think deadlock can be avoided? Explain. [5]
8. Explain Inter-Process Communication in Linux. [5]
9. List different file structures and explain them. [5]

10. Calculate the average waiting time and turn around time using priority algorithm (Priority 1 being the highest) for the given scenario: [5]

PID	Burst Time (s)	Arrival Time	Priority
A	3	0	3
B	2	2	3
C	4	2	2
D	2	3	1

11. Explain memory mapped IO. [5]

12. Write short notes on [2x2.5=5]
    a) Virtual memory
    b) Race condition