Code No: 115EH

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, May/June - 2019
OPERATING SYSTEMS
(Common to CSE, IT)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Distinguish between the client-server and peer-to-peer models of distributed systems. [2]
 b) Define the essential properties of Time-sharing systems and Clustered systems. [3]
 c) What is a scheduler process? Explain its role. [2]
 d) Describe the differences between short-term scheduler and long-term scheduler. [3]
 e) What is the need of mapping between logical address and physical address? [2]
 f) What is thrashing? [3]
 g) What is file system mounting? [2]
 h) Discuss the objectives for a file management system. [3]
 i) What are the four conditions required for deadlock to occur? [2]
 j) What are the principles of protection? [3]

PART - B

(50 Marks)

2.a) Explain various system calls for process management.
 b) With a neat diagram describe how a modern computer works? [5+5]

OR

3.a) Explain about the structure of OS.
 b) Explain about the services of operating system. [5+5]

4. Following is the snapshot of a CPU

Process	CPU Burst	Arrival Time
P1	10	0
P2	29	1
P3	03	2
P4	07	3

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 10) scheduling algorithms. [10]

OR

5. What is a semaphore? Explain how producer-consumer problem is solved using semaphores with example pseudo code. [10]

6.   Give the detailed description of hardware implementation of a page table with translation Look-Aside Buffer.   [10]

OR

7.a)   Consider a swapping system in which memory consists of the following hole sizes in memory order: 12 KB, 4 KB, 24 KB, 15 KB, 9 KB, 7 KB, 10 KB, and 11 KB. Which hole is taken for successive segment requests of : (i) 14 KB (ii) 8 KB   (iii) 5 KB for first fit, best fit, worst fit, and next fit approaches.

   b)   Explain briefly about optimal Page replacement algorithm.   [5+5]

8.   Explain the following with relevant diagrams:
        a) Single level directory structure.
        b) Tree-structured directory structure.   [5+5]

OR

9.a)   Explain about the free space management.

   b)   Explain about the linear list and hash table data structures to implement a directory.
                                                                                     [5+5]

10.   Consider the following snapshot of a system:

Processes	Allocation	Max	Available
	A B CD	A B CD	A B C D
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:
a) What is the content of the matrix Need?
b) Is the system in a safe state?
c) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?   [3+3+4]

OR

11.   What is meant by authentication? Why simple password protection is the most common authentication scheme in use today? Discuss the weakness inherent in the password protection scheme.   [10]

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