Question Paper

Exam Date & Time: 13-Jun-2023 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION-MAY 2023
IV SEMESTER B.Sc.(APPLIED SCIENCES) IN ENGG.

OPERATING SYSTEMS [ICS 242 - S2]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data if any, may be suitably assumed.

1) List and explain the possible ways for the user to interact with the system. (3)

A)

B) Classify Different storage architectures with illustration based on speed, cost, and volatility. (3)

C) Explain the handling of a user application invoking the open() system call with a neat diagram and state the purpose of medium-term scheduler with neat diagram. (4)

2) With the help of a Gannt Chart for the following data calculate average waiting time for priority scheduling. (3)

A)

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

B) Scheduling the following processes P1,P2,P3,P4,P5,P6 using pre-emptive Round Robin algorithm. Illustrate the scheduling using Gannt Chart. Calculate Average Waiting time and Turnaround time. Quantum=2ms. (4)

Process	Arrival Time	Burst Time
P1	0	4
P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	6	3

C) Write down the code for creating and joining 20 threads using P-thread libraries. (3)

3) Describe with pseudo-code, how hardware-based locks address all the issues related to critical section problem. (4)

A)

B) Consider a reference string: 4, 7, 6, 1, 7, 6, 1, 2, 7, 2. The number of frames in the memory is 3. Find out the number of page faults with respect to Optimal Page Replacement Algorithm, FIFO Page Replacement Algorithm, LRU Page Replacement Algorithm. (6)

4) Assume that a disk drive has cylinders numbered 0 to 4999. Cylinder 143 is currently serving by drive, and the cylinder 125 was a previous request. The 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 are pending requests. Suggest any two best disk-scheduling algorithms from FCFS, SSTF, SCAN, LOOK, C-SCAN and C-LOOK, those uses minimum distance to satisfy all the pending requests. Justify your answer. (7)

A)

B) Explain in detail about segmentation architecture. How protection is achieved in segmentation? (3)

5) Write short notes on directories. Explain its types with suitable diagram and examples. (5)

A)

B) Define file. List its attributes and operations. Explain sequential and direct access methods of a file with examples. (5)

-----End-----