1" Assignment for 4th Semester

Subject: - Operating System;

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Unit 1) An Overview on Operating System;

Answer the following questions;

1) What is Operating System? What are the functions of an OS?

2) Explain the structure of an Operating System?

3) Illustrate a brief history on Operating System.

4) Explain two views of Operating System?

5) What are the services of Operating System? Explain them.

6) What are the different types of Operating System used? Explain with their features.

7) What is meant by system call? Discuss it with suitable diagram

8) What is a shell? Why it is necessary in an OS?

9) What is open source software? Explain

10) Write short notes on:

a) Multi Programming;

b) Multiprocessing:

c) Multi-Threading:

d) Multi-Tasking:

e) Multiuser;

Unit 2) Process Management;

1) What is Process? What are the attributes of process (Process Control Block)?

2) Draw a State Diagram of Process and explain it in detail.

3) What is IPC? What are the classical IPC problems? Explain with examples.

4) Briefly explain Process Scheduling and describe types of Schedulers.

5) What do you mean by critical section? Explain in brief.

6) What is meant by race condition? List the techniques that can be used for solving it and discuss semaphore.

7) Explain with the following terms of Process:

a. Mutual Exclusion and its implementation

b. Busy waiting.

c. Strict alternation.

d. Message passing.

e) Lock variables.

f) Test & Set lock.

8) Briefly explain the concept of semaphores with suitable diagram?

9) Explain the multithreading concept? How the threads are implemented in a user's space? List out the merits and demerits of implementing threads in user's space.

10) Explain the concept of Context Switching with suitable diagram and example.

11) What is fork system call? How does the fork system call execute.

12) Explain the following terms of CPU scheduling algorithm:

a. Compute-Bonded Vs I/O Bound Process:

b. Pre-emptive and Non-Pre-emptive modes

13) Write short notes on the following terms of CPU scheduling. Burst Time. Turn Around Time. Completion Time. Response Time, Arrival Time. Waiting Time,

14) Explain the concept of following CPU Scheduling algorithm with suitable example.

a. First Come First Serve:

b. Shortest Job First (SJF):

c. Shortest Remaining Time First;

d. Round Robin:

15) Find average turnaround time and average waiting time for FCFS, SJF, SRTF and RR scheduler (quantum 4).

Process ID	Arrival time	Burst Time
P1	0	15
P2	0	10
P3	0	13
P4	0	20

16) Find average turnaround time and average waiting time for FCFS scheduler and RR scheduler (quantum 10).

Process ID	Burst Time	Arrival Time
A	34	0
B	23	0
C	18	15
D	27	18

17) Calculate the Average TAT and Average WT for SJF and SRTF scheduling.

Process Id	Burst Time	Arrival Time
I	25	21
J	13	8
K	21	16
L	9	10
M	16	2

18) What is deadlock? What are the four conditions for deadlock? Explain in brief.

19) How the deadlocks are handled? Briefly explain them.

20) What is Banker's Algorithm? Explain it with examples.

Unit 3) Memory Management;

1) What is memory management? What are the major functions of memory management?

2) Explain the following terms in detail with figure.

a. Fence Address b. Base and Limit Register,

c. Hardware protection d. Dynamic Loading and Dynamic Linking:

3) What is swapping? Briefly explain the standard swapping procedure with diagram.

4) How the memories are partitioned? Also explain Multi programming with Fixed Task (MFT)

5) Illustrate MVT (Multi-programming with Variable Task) with suitable examples.

6) What is fragmentation? Explain Internal and External fragmentation with suitable examples.

7) The memory allocation are listed as 250k. 120k, 345k, 220k & 300k and we have to place the processes of 110k. 340k. 140k 250k and 100k using First Fit Algorithm. Also calculate Internal and external fragmentation respectively.

8) On given 6 memory allocation of 150k, 200k. 250k. 120k 100k and 300k. place the processes of 100k, 280k, 240k 110k and 100k using First Fit, Best Fit, and Worst Fit Algorithm.

9) What is paging? Describe paging hardware with clear figure.

10) What is virtual memory? Also describe demand paging along with its merits and demerits.

11) Explain the concept of page replacement algorithm. Also mention about "Belady's Anomaly".

12) If the 3 frames are allocated to the process, calculate no of page faults for the following reference string using FIFO, Optimal & LRU page replacement algorithm.

4, 2, 1, 3, 2, 4, 6, 7, 5, 4, 2, 4, 5, 7, 6, 4, 3, 7, 5, 2;

13) A CPU is allocating 4 frames for a processor; calculate no of page faults for the following reference string using FIFO, Optimal & LRU page replacement algorithm.

7, 3, 2, 1, 4, 3, 1, 2, 5, 2, 1, 3, 4, 6, 7, 5, 4, 1, 2, 3,

14) What is segmentation? Illustrate alone with Hardware supports in segmentation. (Assume suitable example and clear diagram.)

15) Find out the physical address for the following logical address space using the following segment table;

Seg #	Base	Limit
0	518	220
1	278	215
2	52	150
3	740	735
4	1745	360

Logical Address Space: -0320. 1198,2145, 3835, 4265

All the Best