KADI SARVA VISHWAVIDYALAYA

GANDHINAGAR

B.E. CE/IT KSV EXAMINATION NOV 2022

Date : 11/11/22	**Branch : CE/IT**
Subject Name & Code: Operating Systems CT404-N	**Semester : 4**
Time : 10:00 TO 1:00 PM	**Max. Marks : 70**

Instructions:
1) All questions are **compulsory**.
2) Figures to the right indicate full marks.
3) Use of scientific calculator is permitted.
4) Indicate clearly, the options you attempt along with its respective question number.
5) Use the last page of main supplementary for **rough work**.

SECTION - 1

Q.1 **(A)** What is Operating System? Explain any one types of operating system **[5]**

(B) Explain the objectives and functions of operating systems. **[5]**

(C) What do you mean by scheduling? Discuss in brief types of scheduler.

OR

(C) What is thread? Why thread is called lightweight process? **[5]**

Q.2 **(A)** Explain different states of a process with a suitable diagram. **[5]**

(B) What Critical section Problem and list the requirements to solve it. Write Peterson's Solution for the same **[5]**

OR

Q.2 **(A)** What is Deadlock? Explain safe and unsafe state with example **[5]**

(B) What is Semaphore? Explain the implementation of Readers-Writers Problem using Semaphore. **[5]**

Q.3 **(A)** What is PCB? Discuss its major fields. **[5]**

(B) Consider the set of Processes with the length of the CPU burst time given in ms. **[5]**
Draw the Grantt chart illustrating the execution of these processes using SJF,FCFS and Priority. Calculate TAT and WT for all process.

Process	Arrival Time	Burst Time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

OR

Q.3 **(A)** Explain Dining philosopher problem and its solution using semaphore. **[5]**

(B) Considering a system with five processes P_0 through P_4 and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. **[5]**

Process	Allocation	Max	Available
	A B C	A B C	A B C
P0	0 1 0	7 5 3	3 3 2
P1	2 0 0	3 2 2	
P2	3 0 2	9 0 2	

P3	2 1 1	2 2 2	
P4	0 0 2	4 3 3	

1. What will be the content of the Need matrix?
2. Is the system in a safe state? If Yes, then what is the safe sequence?
3. What will happen if process P_1 requests one additional instance of resource type A and two instances of resource type C?

SECTION-2

Q.4 **(A)** What are the differences between? a) Logical and physical address? b) Page table and segment table? **[5]**

(B) What is demand paging? Explain how it works. **[5]**

(C) Explain file attribute and file operation in brief.

OR

(C) Explain address translation in paging. **[5]**

Q.5 **(A)** What is address binding? Explain the concept of dynamic relocation of addresses. **[5]**

(B) Suppose a disk having 200 tracks(0-199) The request sequence (82,170,43,140,24,16,190,) of disk and the head start at 50. **[5]**
1). FCFS 2). C-SCAN 3).SCAN 4).SSTF

OR

Q.5 **(A)** What is paging? What is page table? Explain the conversion of virtual to physical address in paging with example **[5]**

(B) Consider the following reference string. Calculate the page fault rates for below page replacement algorithm. Assume the memory size is 3 page frame. **[5]**
4,7,6,1,7,6,1,2,7,2
1). FIFO 2). LRU 3). Optimal

Q.6 **(A)** Explain TLB and Virtual . **[5]**

(B) Explain the Unix Command **[5]**

1. Man
2. Cat
3. Sort
4. Grep
5. chmod

OR

Q.6 **(A)** Write a script for accept a five-digit number through keyword, then reverse this five-digit Number. **[5]**

(B) Which are the major goals of I/O software? Explain DMA. **[5]**

----------BEST OF LUCK----------

KADI SARVA VISHWAVIDYALAYA
GANDHINAGAR

B.E. CE/IT KSV EXAMINATION JUNE 2022

Date : 13/6/22	**Branch : CE/IT**
Subject Name & Code: Operating Systems CT404-N	**Semester : 4**
Time : 12:30 TO 3:30 PM	**Max. Marks : 70**

Instructions:
1) All questions are **compulsory**.
2) Figures to the **right** indicate full marks.
3) Use of scientific calculator is permitted.
4) Indicate **clearly**, the options you attempt along with its respective question number.
5) Use the last page of main supplementary for **rough work.**

SECTION - 1

Q.1 (A) Define Operating System. Give view of OS as a resource manager [5]

(B) What is system call? How it is handled by an OS? [5]

(C) What is PCB? Explain the significance of PCB

OR

(C) What is thread? Why thread is called lightweight process? [5]

Q.2 (A) What are the objectives of OS? How time sharing differ from multiprogramming? If so explain. [5]

(B) What Critical section Problem and list the requirements to solve it. Write Peterson's Solution for the same [5]

OR

Q.2 (A) What do you mean by scheduling? Discuss in brief types of scheduler. [5]

(B) What is Semaphore? Explain the implementation of Readers-Writers Problem using Semaphore. [5]

Q.3 (A) What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented? [5]

(B) Consider the following five processes with the length of the CPU burst time in milliseconds [5]

Process	Burst Time	Priority
P1	10	3
P2	1	1

P3	2	3
P4	1	4
P5	5	2

Processes are Assumed to have arrived at time 0. For the above set of processes find the average waiting time and average around time for each of the following scheduling algorithm using Gantt chart. Consider 1 is highest priority.

1. SJF
2. Non preemptive Priority
3. RR (Q = 2)

OR

Q.3 **(A)** Explain following Commands in UNIX with example. [5]

1. cat
2. grep
3. Pipe
4. Sort
5. Put

(B) Consider the snapshot of the system with Five Processes and Four types of resources [5]

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	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				

Currently Available set of resources is (1,5,2,0).
Answer the following Questions using banker's algorithm.
1) Find the content of Need Matrix.
2) Is the System in Safe State?
3) If request from Process P1 arrives for (0,4,2,0) can the request be granted immediately

SECTION-2

Q.4 **(A)** Compare multiprogramming with fixed partition and multiprogramming with variable partition with diagram. [5]

(B) Explain address translation in paging. [5]

(C) Explain file attribute and file operation in brief.

OR

(C) What is paging? What is page table? Explain the conversion of virtual to physical address in paging with example. [5]

Q.5 (A) What is fragmentation? Explain the difference between internal and external fragmentation. [5]

(B) A disk drive has 640 cylinders numbered 0-639. The drive is currently serving the request at cylinder 68. The queue of pending request in FIFO order is 84,153,32,128,10,133,61,69 [5]
Starting from the current head position what is the total distance that the disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms
1). FCFS 2). C-SCAN 3).SCAN 4).SSTF

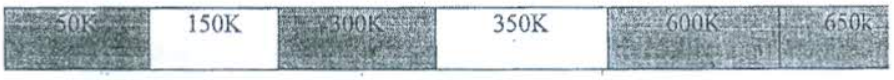
OR

Q.5 (A) Explain Belady's Anomaly and the measures to prevent it. [5]

(B) Consider the following reference string. Calculate the page fault rates for below page replacement algorithm. Assume the memory size is 3 page frame [5]
1,2,3,4,5,3,4,1,6,7,8,7,8,9,5,4,2,4,9
1). FIFO 2). LRU 3). Optimal

Q.6 (A) Explain all Accessing Methods of File. [5]

(B) Consider following diagram and place the memory blocks P1- 300K,P2 - 25K,P3 - 125K, P4 - 50K in order of first fit, best fit, worst fit. Also write which allocation is better. [5]



OR

Q.6 (A) Which are the major goals of I/O software? Explain DMA [5]

(B) Explain the design principles of security. [5]

----------BEST OF LUCK----------