Enroll. No._____

MARWADI UNIVERSITY

Faculty of Technology

[INFORMATION TECHNOLOGY/ COMPUTER ENGINEERING]

[B.Tech] SEM: 4th SUMMER:2018

Subject: - (operating system) (01CE0401) **Date:- 19/04/2018**

Total Marks:-100 **Time:- 03:00 hours**

Instructions:

1. **All Questions are Compulsory.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Question: 1.

(a) MCQ [10]

1. A solution to the problem of external fragmentation is:
   (A) compaction
   (B) larger memory space
   (C) smaller memory space
   (D) none of the mentioned

2. A process is _____
   (A) A program in main memory
   (B) Program in cache memory
   (C) program in secondary storage
   (D) program in execution

3. The only state transition that is initiated by the user process itself is:
   (A) block
   (B) wakeup
   (C) dispatch
   (D) none of the mentioned

4. The two kinds of semaphores are:
   (A) mutex & counting
   (B) binary & counting
   (C) counting & decimal
   (D) decimal & binary

5. A _____is a collection of processors that do not share memory, peripheral devices,or a clock.
   (A) Computer system
   (B) distributed system
   (C) network
   (D) None of the above

6. Round robin scheduling is essentially the preemptive version of
   (A) FIFO
   (B) SJF
   (C) SJF preemptive
   (D) Longest time first

7. A _____ allows you to organize your files by creating a directory structure and it also keeps track of the directories and files [Fill in the Blank]

8. _____ allows for much greater security and explains why Windows NT, Professional, XP and Server are typically used in a business environment. [Fill in the blank]

9. The circular wait condition can be prevented by
   (A) defining a linear ordering of resource types
   (B) using thread
   (C) using pipes
   (D) all of the mentioned

10. Which of the following process scheduling algorithm may lead to starvation
   (A) FIFO
   (B) Round Robin
   (C) Shortest Job Next
   (D) None of the above

(b) Define/Explain the following [10]

1. Mutual Exclusion
2. Response Time
3. Waiting Time
4. Page Fault
5. PWD
6. GREP [Command]
7. AWK [Command]
9. Sector
10. Cylinder

Question: 2.

(a) What is memory mapped I/O ? Explain Device Controller in detail. [08]

(b) Explain working of DMA with suitable diagram. [08]

OR

(b) What is process? Draw a process state transition diagram using five states and explain interpretation of each transition. [08]

Question: 3.

(a) Find the average waiting time and turnaround time for the following processes by using first come first serve and round robin scheduling

Process	Burst Time	Arrival time
P1	8	0
P2	1	4
P3	2	2
P4	1	5

CPU burst time is in milliseconds and assume time quantum of 2ms. 08]

(b) Explain Interrupt & Trap with example. . [04]

(c) Explain Producer consumer problem with solution (code). [04]

OR

(a) Find the average waiting time and turnaround time for the following processes by using non preemptive Shortest Job First and preemptive priority scheduling

Process	Burst Time	Arrival time	Priority
P1	8	0	4
P2	1	4	2
P3	2	2	3
P4	1	5	1

CPU burst time is in milliseconds and assume lower no as higher priority. [08]

(b) What is a page and what is a frame. How are the two related? [04]

(c) Describe Worst -fit and Next-fit strategies for disk space allocation, with their merits and demerits. [04]

Question: 4.

(a) Consider the following page reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 How many page faults would occur for the following replacement algorithms, assuming three frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.
1. LRU Replacement
2. FIFO Replacement [08]

(b) Explain any one deadlock detection techniques with example. [04]

(c) Explain seek time, rotational delay and actual data transfer rate. & Explain FCFS disk arm scheduling algorithm. [04]

OR

(a) Disk requests come in to the disk for cylinders 100, 175, 51, 133, 8, 140, 73 and 77. A seek takes 6 msec per cylinder move. How much seek time is for Shortest Seek Time First and C-SCAN algorithm? Initially arm is at cylinder 63 and we have 200 cylinders. [08]

(b) Explain difference between kernel mode and user mode execution of process. [04]

(c) What is swapping? Why does one need to swap areas of memory? [04]

Question: 5.

(a) Compare and explain paging and segmentation with suitable diagram and example. [08]

(b) Differentiate preemptive and non-preemptive scheduling. Compare FCFS and RR based on performer criteria. [04]

(C) What is the purpose of a TLB? Explain the TLB lookup with the help of a block diagram, explaining the hardware required. [04]

OR

(a) Compare and explain different types of RAID with its merits and demerits. [08]

(b) Explain peterson's solution with code. [04]

(c) Explain process control block with all fields. [04]

Question: 6.

(a) Disk requests come in to the disk for cylinders 95, 180, 34, 119, 11, 123, 62 and 64. A seek takes 7 msec per cylinder move. How much seek time is for First Come First Serve and C-Look algorithm? Initially arm is at cylinder 100 and the tail is at 199 [08]

(b) Explain IPC Problem – Readers & Writers Problem with code. [04]

(c) What is the difference between character special file and block special file access mehod. [04]

OR

(a) Consider the following page reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 How many page faults would occur for the following replacement algorithms, assuming four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.
1. Optimal Page Replacement
2. FIFO Replacement [08]

(b) Discuss paged- segmented memory management. [04]

(c) What is critical section ? Explain with example. [04]

---Best of Luck---

Que. Paper weight-age as per Bloom's Taxonomy

No.	Que. Level	% of weight-age	
		% of weight –age	Que. No.
1	Remember/Knowledge	30%	Question 2(a) and (b), question 3(b), Question 5(b), Question 6(a)
2	Understand	22%	Question 1 (a) and (b) Question 4(c)
3	Apply	28%	Question 3(c) question 4(a) and (b) Question 5(c) Question 6(a)
4	Analyze	12%	Question 5(a) Question 6(b)
5	Evaluate	8%	Question 3(a)
6	Higher order Thinking	---	----

GRAPH:

Question Paper weightage as per Blooms Taxonomy