USN	1	M	S							

RAMAIAH
INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A' Grade

MAKEUP EXAMINATIONS – FEBRUARY 2018

Course & Branch : B.E. : Computer Science & Engineering. **Semester : V**
Subject : Operating Systems **Max. Marks : 100**
Subject Code : CS51/CS512/CS1551 **Duration : 3 Hrs**

Instructions to the Candidates:
- Answer one full question from each unit.
- For the problematic questions, assume the missing data.

UNIT- I

1. a) Illustrate concurrency problems in multi-threaded technique with a program. CO1 (06)

   b) Justify the statement "Time Sharing operating mechanism is employed by all modern Operating Systems" CO1 (06)

   c) Consider the following set of processes with arrival time and burst time CO2 (08)

Process	Burst-Time	Arrival Time
P1	5	0
P2	7	1
P3	8	2
P4	4	3

Draw the Gantt chart and find the average waiting time and turnaround time by using the following scheduling algorithms
i) FCFS algorithm ii) Preemptive SJF algorithm.

2. a) With a code snippet explain how operating systems performs context switch in xv6 architecture. CO1 (06)

   b) Describe various design goals of an operating system. CO1 (06)

   c) Consider the following set of processes with priority and burst time CO2 (08)

Process	Priority	Burst-Time
P1	0	8
P2	1	5
P3	4	4
P4	2	6

Draw the Gantt chart and find the average waiting time and turnaround time by using the following scheduling algorithms
i) Round Robin algorithm(Time slice=2ms)
ii) Non Preemptive Priority algorithm(Assume lowest number has highest priority).

UNIT- II

3. a) Justify "Multi-Queue Scheduling increases throughput than single-queue scheduling" in the system. CO2 (08)

   b) Demonstrate the translation of virtual address to physical address with an example and necessary diagram. CO3 (06)

   c) Identify the cache affinity problem in multi processor systems and provide the solution for the same. CO3 (06)

4.	a)	Explain the contents of a page table entry with an address fomat.	C03	(06)
	b)	Describe the usage of migration and work stealing techniques in Multi queue scheduling algorithm.	CO2	(06)
	c)	Identify the reasons for cache coherence problems in multiple CPU environments and provide the solutions for the same.	CO2	(08)

UNIT- III

5.	a)	Describe various solutions to manage TLBs on a context switch.	CO3	(06)
	b)	Consider the following page reference string 1,2,3,4,3,1,2,6,5,2,7,3,7,6,5,3,1,4,7,5,1,2 Calculate the number of page faults using i) LRU ii) Optimal page replacement algorithms. Assume number of frames=3	CO3	(08)
	c)	Justify the support of sharing in segmentation technique of memory virtualization with a suitable example.	CO3	(06)
6.	a)	Describe MIPS real TLB entry with a suitable diagram.	CO3	(06)
	b)	Explain the following terms: i) Memory overlays ii) Swap Space iii) Page Fault iv) Thrashing.	CO3	(06)
	c)	Describe the page-fault control flow algorithm (hardware).	CO3	(08)

UNIT- IV

7.	a)	Explain the process of creating a thread to provide concurrency.	CO4	(06)
	b)	List out the features of a binary semaphore using locks	CO4	(06)
	c)	With a code snippet describe semaphore as a condition variable.	CO4	(08)
8.	a)	Demonstrate the sequence of thread execution (three thread traces) with simple thread creation code.	CO4	(10)
	b)	With a code snippet show that adding incorrect mutual exclusion to the producer-consumer problem leads to deadlock.	C04	(10)

UNIT- V

9.	a)	Identify the problems of using journaling technique of recovering the files and also explain how to overcome from those identified problems.	CO5	(06)
	b)	With a diagram explain inode bitmap and a data bitmap file system structures on the disk.	CO5	(06)
	c)	With a neat diagram discuss how disk performs sequential reads among different track boundaries.	CO5	(08)
10.	a)	Describe journaling technique with an example	CO5	(06)
	b)	Explain with a neat diagram the overall organization of a disk by considering system has a series of blocks, each of size 4KB and the blocks are addressed from 0 to N-1.	CO5	(06)
	c)	Suppose that a disk drive has 200 cylinders numbered from 0-199. The drive is currently serving a request at cylinder 90, the following is the queue of pending requests in FIFO order, 178, 47, 96, 52, 136, 172, 15 Starting from the current head position, what is the total distance that the disk arm moves to satisfy the pending requests for each of the following disk-scheduling algorithms? i. Shortest Seek Time First ii. C-SCAN.	CO5	(08)

****