Total No. of Questions : 10]

SEAT No. :

P2475

[Total No. of Pages : 4

[5253] -198
T.E. (Information Technology) (Semester - II)
OPERATING SYSTEM
(2012 Pattern)

Time : 2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answers Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***

2) ***Neat diagrams must be drawn wherever necessary.***

3) ***Figures to the right side indicate full marks.***

4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) State the essential difference between the following types of OS : Batch processing, multiprogramming, real - time. **[6]**

b) Consider a computer with N processors in a multiprocessor configuration.**[4]**

i) How many processes can be in each of the Ready, Running, and Blocked states at one time?

ii) What is the minimum number of processes that can be in each of the Ready, Running, and Blocked states at one time?

OR

Q2) a) What is the purpose of system calls, and how do system calls relate to the OS and to the concept of dual - mode (kernel mode and user mode) operation. **[6]**

b) Describe in detail the functions of OS as a resource manager. **[4]**

P.T.O.

Q3) a) Consider the following set of processes : **[6]**

Process Name	Arrival Time	Processing Time
A	0	3
B	1	5
C	3	2
D	9	5
E	12	5

Apply RR with $q = 1$, SJF (Preemptive) and show Avg. waiting time and Turn around time.

b) List the key design issues for an SMP operating system. **[4]**

OR

Q4) a) Draw and explain the Unix process state transition diagram. **[6]**

b) Define the terms : **[4]**

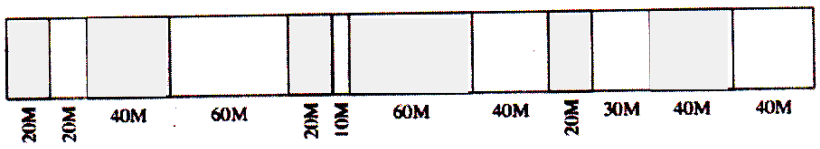
i) Deadlock

ii) Livelock

iii) Turnaround time and

iv) Response time

Q5) a) A dynamic partitioning scheme is being used, and the following is the memory configuration at a given point in time : **[6]**



The shaded areas are allocated blocks; the white areas are free blocks. The next three memory requests are for 40 M, 20 M, and 10M. Indicate the starting address for each of the three blocks using the following placement algorithms:

i) First - fit

ii) Best - fit

iii) Worst - fit

b) Describe the following : **[6]**

i) Principle of locality

ii) Thrashing &

iii) External Fragmentation

c) A 1 - Mbyte block of memory is allocated using the buddy system. **[6]**

i) Show the results of the following sequence with a figure for Request 100 K, Request 240 K, Request 64 K, Request 256 K, Release 240, Release 100, Request 75 K, Release 64, Release 240, Release 256

ii) Show the binary tree representation following Release 240.

OR

Q6) a) Explain the following terms in brief : **[6]**

i) Working set model

ii) Thrashing

iii) Lazy swapper

b) Given the following page reference string : 1, 2, 3, 2, 5, 6, 3, 4, 6, 3, 7, 3, 1, 6, 3, 4, 5, 3, 2, 4, 3, 4, 5, 1 Number of page frames are 4. Show the page trace and calculate the number of page frames for the following page replacement policies **[12]**

i) LRU

ii) Optimal

iii) FIFO

Also explain Belady's anomaly.

Q7) a) A disk drive has 640 cylinders, numbered 0 - 639. The drive is currently serving the request at cylinder 68. The queue of pending requests in FIFO order is : 84, 153, 32, 128, 10, 133, 61, 69. Starting from the current head position, what is the total distance that the disk arms moves to satisfy all the pending requests for the following disk scheduling algorithms: **[12]**

i) FCFS

ii) C - SCAN

iii) SCAN

iv) SSTF

b) Why I/O buffering is necessary? State and explain different I/O buffering techniques. **[6]**

OR

Q8) a) Assume a disk with 200 tracks and the disk request queue has random requests in it as follows : 55, 58, 39, 18, 90, 160, 150, 38, 184. Find the no. of tracks traversed and average seek length if

i) FIFO

ii) SSTF

iii) C - SCAN

iv) SCAN

is used and initially head is at track number 100 **[12]**

b) Describe the following : **[6]**

i) File sharing

ii) Record blocking

Q9) a) Write characteristics of following : **[14]**

i) Ubuntu EDGE

ii) Embedded Linux

iii) NACH Operating System

iv) Android OS.

OR

Q10) a) Write a steps for kernel compilation with necessary commands. **[6]**

b) Write a pseudo code for simple kernel module and explain procedure of inserting a new module in existing kernel with all necessary steps. **[8]**

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