

Total No. of Questions : 8]

SEAT No. :

P4406

[Total No. of Pages : 2

[4760] - 1193

M.E. (Computer Engineering) (Semester - II)

OPERATING SYSTEM DESIGN

(2013 Pattern)

Time :3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Attempt any four from Q. No. 1 to 6, Q. No. 7 & 8 compulsory.*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Design a connection protocol for using a random number generator package. [4]

b) Explain why kernel mode processes are really the same thing as threads in the operating system? [4]

Q2) a) Why hardware instructions are removed from the virtual processor? Why they are removed? How they are removed? What are they replaced with? [4]

b) Describe the interaction between the CreateProcess, Wait and Exit system calls. [4]

Q3) a) Demonstrate how rendezvous pattern consists of two signaling pattern. [5]

b) Explain the system calls for interrupt handling. [3]

Q4) a) Why the space allocated to a stack automatically increased when the stack overflow it? Why is there a limit to how much it can be increased altogether? [4]

b) Explain the memory management design problem. What are the solutions available to memory management design problem? [4]

P.T.O.

- Q5)** a) Suppose you have 16 M bytes of main memory. Using the list method, you have an overhead of eight bytes per memory block. Using the bitmap method, you use an allocation granularity of 126 bytes. How many blocks are there when the space overhead of both methods is the same? What is the average block size for this many blocks? [5]
- b) Show the code to read disk block 100 into address 0X2000. [3]
- Q6)** a) The commands to a terminal to print an ASCII character contain only the characters, and do not say where to place the character on the screen. Why did design it like this. [4]
- b) Explain the mechanism for protecting hardware and software resources. [2]
- c) Explain two levels of index blocks with examples. [2]
- Q7)** a) With the help of mathematical model demonstrate the working of IPC pattern for mutual exclusion and singling. [5]
- b) Implement the following change to the simple operating system. When a process makes a system call the time it has remaining is recorded. The next time it executes it gets that time plus 100 more milliseconds. But no process can get more than 300 milliseconds. [4]
- Q8)** a) What makes the caching work?. How does dynamic programming use caching? [3]
- b) Give the advantages of a DMA device controller over a non-DMA device controller. [3]
- c) Write short notes on micro-kernel operating system. [3]

