

**5E3255**

Roll No. : \_\_\_\_\_

Total Printed Pages : **3****5E3255****B. Tech. (Sem. V) (Main/Back) Examination, December - 2013****Computer Science****5CS5 Operating System**

(Common for Computer &amp; IT)

Time : **3 Hours**][Total Marks : **80**[Min. Passing Marks : **24**

*Attempt any five questions. Selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)

1. \_\_\_\_\_ **NIL**2. \_\_\_\_\_ **NIL****UNIT - I**

1 (a) Explain the following :

- (i) Process
- (ii) Thread
- (iii) Kernel
- (iv) System call.

4×2=8

(b) Define Operating System. Explain how operating system acts as a resource manager ? Differentiate between Multiprogramming and Multi-processing ?

8

**OR**

1 (a) Explain the various states of a process using a suitable diagram.

5

(b) Explain the various services that are provided by the operating system in brief.

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1 (c) Differentiate between :

- (i) User thread/Kernel thread
- (ii) System call / function call.

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[Contd...

## UNIT - II

- 2 (a) What is critical section problem ? How are semaphores used for solving critical section problem. 8
- (b) Describe the solution of Dining-Philosophers problem. 8

OR

- 2 (a) Consider the following set of process with the arrival time and CPU burst time given in milliseconds :
- | Process | Arrival time | CPU burst time |
|---------|--------------|----------------|
| P1      | 0            | 24             |
| P2      | 3            | 7              |
| P3      | 5            | 6              |
| P4      | 10           | 10             |
- Determine Average Waiting time and Average turn around time with the preemptive SJF scheduling. 8
- (b) What is scheduling ? Explain short term and long term scheduling. Describe the performance criteria of a scheduler. 8

## UNIT - III

- 3 (a) What is deadlock ? What are the necessary conditions for deadlock to occur ? 8
- (b) Explain the following :
- (i) Resource allocation graph
  - (ii) Recovery from deadlock.
- 4×2=8

OR

- 3 (a) Explain the difference between internal and external fragmentation. 6
- (b) Explain the following :
- (i) Logical and Physical address space.
  - (ii) Dynamic linking.
- 5×2=10

## UNIT - IV

- 4 (a) Explain the various page replacement policies using a suitable example. 10



- (b) Under what circumstances do page fault occurs ? Describe the actions taken by the operating system when a page fault occurs.

6

OR

- 4 Explain the following :
- (i) Demand Paging
  - (ii) Segmentation with paging scheme
  - (iii) Thrashing
  - (iv) Global versus local allocation

4×4=16

### UNIT - V

- 5 (a) Explain various disk scheduling algorithms in brief.
- (b) What are the various access methods for file system ?

8

8

OR

- 5 Explain the following :
- (i) Tree structured directory
  - (ii) Spooling
  - (iii) File system mounting
  - (iv) Memory mapped files.

4×4=16