

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Sixth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Operating System

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. List the different tasks in an operating system. Describe the different computational structures used in an operating system. (06 Marks)
- b. With a suitable timing diagrams, explain the priority assignment rule in a multiprogramming systems. (06 Marks)
- c. Define the following :
 - i) System call
 - ii) Throughput
 - iii) Turn-around time
 - iv) Response time
 With a suitable curve, explain the key features and concerns of different operating system classes. (08 Marks)
- 2 a. With a neat diagram, explain the layered design of operating systems. (08 Marks)
- b. Explain the structure of microkernel based operating system. (06 Marks)
- c. Write an explanatory note on virtual machine operating system. (06 Marks)
- 3 a. With a state transition diagram, explain the different states of a process and its transitions. (06 Marks)
- b. With a neat diagram, explain the threads used in Solaris. (06 Marks)
- c. Discuss the problem of race condition with a suitable example. Explain the method to overcome this problem. (08 Marks)
- 4 a. Discuss the methods used to achieve the memory protection with a suitable diagram. (08 Marks)
- b. Describe the memory allocation methods for the program controlled data. (08 Marks)
- c. Differentiate between contiguous and non-contiguous memory allocation methods. (04 Marks)

PART – B

- 5 a. What is demand paging? Explain the mechanism of address translation buffers with a neat diagram. (08 Marks)
- b. Explain the FIFO page replacement policy and LRU page replacement policy. Find the number of page faults for the following page reference string using these two policies.
Reference string : 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5
Assume page frames = 3. (12 Marks)
- 6 a. With a neat diagram, explain the facilities provided by the file system and IOCS layers. (08 Marks)
- b. Describe the organization of sequential access and direct access files. (06 Marks)
- c. Write an explanatory note on FCB. (06 Marks)

- 7 a. Explain the long term, short term and medium term schedulers. Explain how these schedulers work in case of time sharing system. (10 Marks)
- b. Explain the operation of preemptive scheduling policies and its performance for the data given below :

| Process | P ₁ | P ₂ | P ₃ | P ₄ | P ₅ |
|--------------|----------------|----------------|----------------|----------------|----------------|
| Arrival time | 0 | 2 | 3 | 5 | 9 |
| Service time | 3 | 3 | 2 | 5 | 3 |

(10 Marks)

- 8 a. Explain the Kernel actions to implement message passing using symmetric naming and blocking sends. (06 Marks)
- b. Write an explanatory note on mailboxes. (06 Marks)
- c. Explain how inter-process communication can be done in UNIX. (08 Marks)
