

ECSS01

(Following Roll No. to be filled by candidate)

Roll No.

11104717013

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**B.Tech.
FIFTH SEMESTER EXAMINATION 2015-16
ECSS01
OPERATING SYSTEMS**

Time: 3 hours

Max Mark: 100

Note

- Attempt all questions.
- Marks and number of question to attempt from the section is mentioned before each section.
- Assume missing data suitably. Illustrate the answer with suitable sketch.

1. Attempt any **four** parts of the following: [4X5]
- a. Explain the layered structure of operating system with its components.
 - b. What is Critical Section Problem? Explain Peterson's solution.
 - c. What is real time system? Explain with example.
 - d. What are Deadlock and its conditions?
 - e. Explain Baker's algorithm with example.
 - f. What is Process? Explain the working of schedulers.

2. Attempt any **four** parts of the following: [4X5]
- a. Differentiate among multitasking, multiuser and multiprocessing operating system.
 - b. What operation can be performed on Semaphore? What is the difference between binary and general semaphore?
 - c. Illustrate threads and their management.
 - d. What is Deadlock detection? What are the different techniques of deadlock recovery?
 - e. How can the interprocess communication be achieved.
 - f. Discuss advantages and disadvantages of monolithic and microkernel systems.

3. Attempt any **two** parts of the following: [2X10]
- a. Five batch jobs A through E, arrive at a computer center at essentially the same time. They have an estimated running time of 15, 9, 3, 6 and 12 minutes respectively. Their priorities are 6, 3, 7, 9 and 4 respectively with lower value corresponding to a higher priority. For each of the following scheduling algorithms determine the TAT for each process and the average turnaround time for all jobs :
 - (I) Round Robin (Time quantum = 2)
 - (II) FCFS
 - (III) Priority Scheduling

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- (IV) Shortest Job First
- b. Explain process synchronization using Producer consumer problem and its solution.
 - c. Write short note on
 - (I) File access methods
 - (II) Levels of RAID
 - (III) Process Control Block (PCB)

4. Attempt any **two** parts of the following: [2X10]
- a. Explain various page replacement algorithms with example.
 - b. Consider a paged virtual memory system with 2 bit virtual addresses and 1 Kbytes per page. Each page table entry requires 32 bits. It is desired to limit the page table size to one page.
 - i. How many levels of page table are required?
 - ii. What is the size of the page table at each level?
 - iii. Which strategy consumes the least number of pages—smaller page size at the top or at the bottom level of the page table hierarchy?
 - c. Write short note on
 - (I) Demand Paging
 - (II) Belady's Anomaly
 - (III) Inverted page table

5. Attempt any **two** parts of the following: [2X10]
- a. Suppose that a disk has 500 cylinders. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending request in FIFO order is 80, 1470, 913, 1774, 948, 1509, 1022, 1750 and 130. What is the total distance that the disk arm moves for the following algorithms?
 - i. FCFS
 - ii. SSTF
 - iii. LOOK
 - iv. C-SCAN
 - b. What do you mean by first fit, best fit and worst fit? Explain with example.
 - c. Write short note on
 - i. System calls and Resident monitors
 - ii. Dining Philosopher Problem
 - iii. Trashing