16-11-17 (E)

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Exam
Nov – Dec 2017

Max. Marks:100 **Duration: 3Hrs.**
Class: TY B.Tech Semester: V
Name of the Course: Operating System Branch: Computer
Course Code: UCECE501

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Max. Marks
Q.1	What are the two models of inter-process communication? What are the strength and weaknesses of the two approaches? **OR** What are the five major activities of an Operating system with regard to file management?	10
Q.2(a)	Assume that the following jobs have to execute with a single processor system, with the jobs arriving in the order listed below where a small integer means a higher priority. Process ID | Service Time | Priority P1 | 60 | 2 P2 | 20 | 1 P3 | 10 | 4 P4 | 20 | 5 P5 | 50 | 3 Calculate the following for RR (Time Quantum q=10ms), SRTN, Multilevel feedback Queue(number of Queue : 2)→ Time Quantum for Queue-1 is 10ms Queue-2 is 20ms a. Create a Gantt chart to illustrate the execution of these processes. b. What is the waiting time and turnaround time for all processes? c. What is the average turnaround time and waiting time.	10
Q.2(b)	What are the advantages and disadvantages of using ULT's instead of KLT's.	5

Q.3(a)	Two processes P1 and P2 have been designed so that P2 writes a stream of bytes produced by P1. Write a skeleton of procedures executed by P1 and P2 to illustrate how they synchronize with one another using semaphore. **OR** An Inventory manager issues following instructions to the store manager in regard to a particular item. Do not purchase the item if the no of items existing in the store exceeds N and hold any requisition until the number of items existing in the store is large enough to permit the issue of the item. Using a particular item, implement these instructions with the help of a monitor.	10 10
Q.3(b)	State and explain different mechanisms that can be used to recover a system from deadlock once it is detected. **OR** Explain why spinlocks are not appropriate for single processor system yet are often used in multiprocessor system.	5 5
Q.3(c)	A system is composed of 4 processes [p1,p2,p3,p4] and 3 types of serially reusable resources [R1,R2,R3]. The number of total existing resources are C=[3,2,2]. 1. Process P1 holds 1 unit of R1 and request 1 unit of R2 2. Process P2 holds 2 units of R2 and requests 1 unit each of R1 and R3 3. Process P3 holds 1 unit of R1 and requests 1 unit of R2 4. Process P4 holds 2 units of R3 and requests 1 unit of R1. Show the reusable resource graph to represent this system state. Can the above required resource request granted in the current state If granted, give the order of process execution. If not granted, which processes are in deadlock state?	10
Q.4(a)	Disk track request queue is : 27, 129, 110,186, 147, 41, 10, 64, 120 Assume that the disk head is initially positioned over track 100 and total tracks on disk are 200. Represent the disk head movement graphically and calculate the number of tracks traversed and average seek length in SCAN, LOOK, C-SCAN a. If disk head is moving in the direction of decreasing track numbers. b. If disk head is moving in the direction of increasing track numbers.	10
Q.4(b)	Explain different file organization techniques with the help of diagram. **OR** Describe different file allocation strategies with the help of diagram.	10

Q.4 (c)	Explain different types of I/O buffering techniques with the help of diagrams. **OR** Draw and explain model of I/O organization for Local peripheral devices, communication port and file system.	10
Q.5(a)	Draw and explain 9-state process state transition model used in UNIX.	10
Q.5(b)	Explain the structure of Modern UNIX file system with the help of Diagram.	10