

Level: Bachelor

Semester – Fall

Year : 2013

Programme: B.E

Full Marks: 100

Course: Applied Operating System

Pass Marks: 45

Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

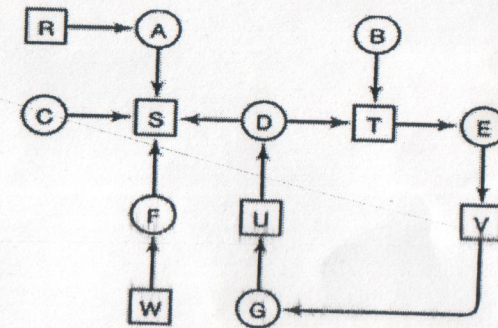
Attempt all the questions.

1. a) What is an Operating System? Briefly describe the Evolution of the Operating Systems. 7
- b) Explain user level thread and kernel level thread. In which circumstances user-level thread is better than Kernel level thread? 8
2. a) Round-robin scheduling behaves differently depending on its time quantum. Can the time quantum be set to make round robin behave the same as any of the following algorithms? If so how? Proof the assertion with an example. 8
  - i. FCFS
  - ii. SJF
  - iii. SRTN
- b) What is Semaphore? How producer-consumer problem is solved using semaphore. Explain with pseudo code. 7
3. a) What is paging? Explain the mapping of virtual address to real address under segmentation in MULTIC architecture. 8
- b) Discuss in detail the use of Translation Lookaside Buffer (TLB) in the process of paging. Support your answer with illustrations. 7
4. a) Describe how free space list is maintained for free space management. 8
- b) Explain the following services provided by the kernel I/O subsystem: 7
  - i) I/O Scheduling ii) Buffering iii) Caching
5. a) What is demand paging? For the following page reference string, 10
 

1,2,3,5,8,3,6,3,1,7,5,8,2,4,1,6,3,1 assuming number of frames = 4, find the total number of page faults using

  - i. Least Recently Used
  - ii. Optimal page replacement algorithm

- b) What is Stable storage? Discuss about stable storage implementation in short. 5
6. a) A disk has 8 sectors track and spins at 600 rpm. It takes the controller time 10ms from the end of one I/O operation before it can issue a subsequent one. How long does it take to read all 8 sectors using the following interleaving system? 8
  - i. No interleaving
  - ii. Single interleaving
  - iii. Double interleaving
- b) What is difference between Deadlock and Starvation? Explain if the resource allocation graph shown below is in deadlocked state or not with necessary algorithm. 7



7. Write short notes on any two: 2×5
  - a) File protection
  - b) Resource Allocation graph
  - c) Fragmentation