Government College of Engineering, Amravati
(An Autonomous Institute of Government of Maharashtra)

Sixth Semester B. Tech. (CS / IT)

Summer – 2016

Course Code: CSU602

Course Name: Operating System Design

Time: 2 hr. 30min.   Max. Marks: 60

Instructions to Candidate
1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1.   Solve any Two

(a)   What do you mean by System Calls? State and explain different categories of System Calls   6M

(b)   Define Process? Explain the different state of process? Describe the reason for transition from one state to another.   6M

(c)   Explain inter process communication. And Difference between direct and indirect communication.   6M

2   **Solve any Two**

(a)   What is Semaphore? What are the different operations define for semaphore? Give an implementation of Semaphore.   6M

(b)   What are the different synchronization problems? Explain each one.   6M

(c)   What is Critical Region ? How it is used to Solve the Critical Section Problem. Explain with Example.   6M

3.   **Solve**

(a)   Under What Circumstances do page fault occure? Describe the actions taken by operation System when page fault occure.   6M

(b)   State the necessary Condition for a deadlock to occur. Consider the following snapshot of a System :   6M

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_3	1 3 5 4	2 3 5 6	
P_4	0 6 3 2	0 6 5 2	
P_5	0 0 1 4	0 6 5 6	

What is the content of Matrix need? Is the system is in safe state? if a request from process P_1 arrives for (0,4,2,0)can the request be granted immediately?

4   **Solve**

   (a)   Consider the following Page-reference string: **6M**
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6.
How many page fault would occure for the
following replacement algorithms assuming one,
two, three, four, five, six, or seven frames?
Remember that all the frames are initially empty,
so your first unique pages will cost one fault each

      (a) LRU replacement
      (b) FIFO replacement
      (c) Optimal replacement

   (b)   What is the cause of thrashing? How does the
system detect Thrashing? Once the system detect   **6M**
thrashing, what can the system do to eliminate
this problem?

   5.   **Solve any TWO**

   (a)   With the reference of process scheduling under   **6M**
Linux explain the scheduling for time sharing,
processes and real-time scheduling.

   (b)   Explain the networking structure of Linux With   **6M**
the different layers implementation.

   (c)   Differentiate between   **6M**
      (a) Buffering and cashing
      (b) Buffering and spooling
      (c) i/o scheduling and buffering