7. a) Differentiate among the following :
   i) Physical address and logical address
   ii) Paging and segmentation
   b) What is distributed system? Discuss the advantages of distributed systems.

8. Write short notes on the following (any four) :
   a) Worms and viruses
   b) Key features of windows file system
   c) Distributed shared memory
   d) Parallel operating system
   e) RPC

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Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

Roll No .....

CS-502

B.E. V Semester

Examination, December 2016

Operating System

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions out of eight questions.
ii) All questions carry equal marks.

1. a) What is Operating System? Define the essential properties of the following types of operating system :
   i) Batch
   ii) Time sharing
   b) Describe the differences among short term, medium term and long term scheduling.

2. a) Discuss various file allocation and access methods. Compare their advantages and disadvantages.
   b) Describe how a file directory system can be organized into one-level, two-level and tree-structure directories.

3. a) Consider the following set of processes :

Process	Processing Time
A	3
B	5
C	2
D	5
E	5

Develop a Gantt-chart and calculate the average waiting time using :

i) FCFS

ii) SJF

iii) Round Robin ($q = 1$)

b) What is Thread? What resources are used when a thread is created? How do they differ from those used when a process is created?

4. a) Briefly explain the following :

i) Mutual exclusion

ii) Critical section problem

b) Write a Semaphore solution for dining philosopher's problem.

5. a) What is Deadlock? What are the four necessary condition for a deadlock of occur?

b) Consider the following snap shot of a system :

	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

Answer the following questions using Banker's algorithm:

i) What is the, content of the matrix need?

ii) If a request from process P_1 arrives for (1, 0, 2) can the request be granted immediately?

iii) Is the system in a safe state?

6. a) Consider the following page reference string

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3,7, 6, 3, 2, 1, 2, 3, 6.

How many page faults occur for the following replacement algorithm, assuming three frames?

i) FIFO replacement

ii) LRU replacement

iii) Optimal replacement

b) What is meant by thrashing? Explain various causes of thrashing.