MIS NO

COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

End Semester Examination –November, 2013

(IT - 09002) SYSTEM PROGRAMMING AND OPERATING SYSTEM

Class: - T.Y. B.Tech (Information Technology)

Year: - 2013-14 **Semester: - V**

Duration: - 3 hr **Max. Marks: - 60**

Instructions:

1. ***All the Questions are compulsory.***
2. ***Assume suitable data whenever necessary.***
3. ***Draw neat figures wherever required***
4. ***Figures to right indicate full marks***

Q.1 A] Give difference between assembler, compiler and interpreter [4]

B] Explain the loosely coupled and tightly coupled architecture of multiprocessor operating system [4]

C] Write a short note on (any two) [4]
1.One Pass assembler 2. Assembler Directives 3. Literal Handling

Q.2 A] Consider the following page reference string: [4]
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.
How many page faults would occur for the following replacement algorithms, assuming, four and five frames?
Remember all frames are initially empty, so your first unique pages will all cost one fault each.
- LRU replacement
- FIFO replacement
- Optimal replacement

B] Explain Belady's Anomaly? [4]

OR

Differntiate Local and Global Page replacemrnt policy

C] Why are page sizes always powers of 2? [4]

Q.3 A] Consider the following system snapshot using data structures in the Banker's algorithm, with resources A, B, C, and D, and process P0 to P4: [6]

	Max				Allocation				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	6	0	1	2	4	0	0	1				
P1	1	7	5	0	1	1	0	0				
P2	2	3	5	6	1	2	5	4				
P3	1	6	5	3	0	6	3	3				
P4	1	6	5	6	0	2	1	2				
									3	2	1	1

Using Banker's algorithm, answer the following questions.
(a) How many resources of type A, B, C, and D are there?
(b) What are the contents of the Need matrix?
(c) Is the system in a safe state? Why
(d) If a request from process P4 arrives for additional resources of (1,2,0,0,), can the Banker's algorithm grant the request immediately? Show the new system state and other criteria.

B] Suggest the any four criteria on which different CPU scheduling algorithms can be compared. [2]

C] What are the pros and cons of choosing a small page size? What are the pros andcons of selecting a large page size? [4]

OR

Explain the LONG,SHORT and MEDIUM term scheduler.

Q.4 A] What is a semaphore? Explain busy waiting semaphores. [4]

B] What is a race condition? Explain how a critical section avoids this condition. What are the properties which a data item should possess to implement a critical section? [4]

C] Explain deadlock detection algorithm for single instance of each resource type. [4]

OR

Is it possible to have a deadlock involving only one single process? Explain your answer.

Q.5 A] Explain different ways for file protection. [4]

B] Justify An acylic –graph directory structure is more flexible than a simple tree structure directory organization. [4]

C] Explain flow model of MPI and OPENMP programming . [4]