## GUJARAT TECHNOLOGICAL UNIVERSITY MCA INTEGRATED - SEMESTER- IV • EXAMINATION – WINTER 2015

Subject Code:4440603 Subject Name: Operating System Time: 02:30 PM to 05:00 PM Instructions:

1. Attempt any five questions.

- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

Q.1 Do as directed.

- (i) \_\_\_\_\_ is a technique for overcoming external fragmentation. (Fill in the Blank)
- (ii) \_\_\_\_\_\_ is known as the management of multiple processes within a uniprocessor system. (Fill in the Blank)
- (iii) A \_\_\_\_\_\_ is a state in which there is at least one sequence of resource allocation to processes that does not result in a deadlock. (Fill in the Blank)
- (iv) When a program tries to access a page that is mapped in address space but not loaded in physical memory, then
  - a) segmentation fault occurs
  - b) fatal error occurs
  - c) page fault occurs
  - d) no error occurs
- (v) Which of the following condition is required for deadlock to be possible?a) mutual exclusion

b) a process may hold allocated resources while awaiting assignment of other resources

c) no resource can be forcibly removed from a process holding it d) all of the mentioned

- (vi) First-in-first-out scheduling is
  - a) Non pre-emptive scheduling
  - b) Pre-emptive scheduling
  - c) Fair share scheduling
  - d) Deadline scheduling
- (vii) Which one of the following is not a function of Operating System
  - a) Resource management
  - b) File management
  - c) Networking
  - d) Process management
- (viii) Unused small chunks of main memory are called pages. (State whether true or false)
- (ix) Mutual Exclusion is needed when single non-sharable resource is shared by more than one process simultaneously. (State whether true or false)
- (x) Define: Starvation
- (xi) Define: Response time
- (xii) Define: Operating System
- (xiii) Define: Fragmentation
- (xiv) Give full form of DMA

P.T.O.

Date: 05/12/2015

**Total Marks: 70** 

14

Q.2	(a) (b)	Draw neat seven state Process State Transition diagram. Explain in detail. Describe the necessary condition for deadlock occurrence. Discuss the deadlock avoidance using Banker's algorithm.	07 07
Q.2	(b)	What is semaphore? Give and explain the algorithm of producer/consumer problem with bounded using general semaphore.	07
Q.3	<b>(a)</b>	What is paging? Explain the logical to physical address translation mechanism with example.	07
	<b>(b)</b>	Give brief description on Types of Scheduling Algorithms. OR	07
Q.3	(a)	What is segmentation? How it differs with paging? Explain address translation in segmentation.	07
	(b)	What do you mean by Pre-emptive and Non-pre-emptive scheduling algorithms? Give example (only names) of both types of algorithms. Explain two Pre-emptive algorithms.	07
Q.4	<b>(a)</b>	Briefly explain the different RAID levels. Support your illustrations with neat sketches.	07
	<b>(b)</b>	Explain thrashing. What is the purpose of Translation Look aside Buffer? Explain in brief.	07
		OR	
Q.4	<b>(a)</b>	<ul><li>(i) Explain briefly the three techniques for performing I/O.</li><li>(ii) What are typical operations that may be performed on a directory?</li></ul>	03 04
	(b)	What do you mean by Page replacement policy? Solve following example using Optimal, LRU, FIFO and Clock polices. Consider a program with five pages and main memory with three page frames. Given below is the page address stream formed by executing the program 2 3 2 1 5 2 4 5 3 2 5 2	07
Q.5	(a) (b)	Briefly explain PCB with neat diagram. Explain different classes of Client Server architecture. What do you mean by three tier Client Server architecture? OR	07 07
Q.5	(a) (b)	Briefly explain Deadlock Prevention. Write a short note on Distributed Message Passing.	07 07

## \*\*\*\*\*