DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VI [INFORMATION TECHNOLOGY]
SUBJECT: (IT 607) Applied Operating System

Examination	**Block Sessional**	**Seat No.**	**:**
Date	**19 /04/2016**	**Day**	**: Tuesday**
Time	**11:00 am - 12:15 am**	**Max. Marks**	**: 36**

INSTRUCTIONS:

1. **Figures to the right indicate maximum marks for that question.**
2. **The symbols used carry their usual meanings.**
3. **Assume suitable data, if required & mention them clearly.**
4. **Draw neat sketches wherever necessary.**

Q.1 Do as directed.

(a) Discuss advantages of Kernel Level Thread. [2]

(b) What are disadvantages of "Hashing based" directory implementation? [2]

(c) State True/False with justification. "If time quantum for Round Robin scheduling is very large, then it behaves same as FCFS scheduling. " [2]

(d) Consider a set of n tasks with known runtimes R1, R2, …, Rn to be run on a uniprocessor machine. Then which processor scheduling algorithms will result in the maximum throughput? [2]

(e) A process executes the following code : fork(); fork(); fork(); fork(); Then what is the total number of child processes created? [2]

(f) Explain convoy effect occurred in FCFS process scheduling algorithm with example. [2]

Q.2 Answer the following questions. [12]

(a) Explain the techniques used to prevent the occurrence of a deadlock. [6]

(b) Discuss various multithreading models. [6]

Q.3 (a) i. A process has been allocated 4 page frames. Assume that none of the pages of the process are available in the memory initially. The process makes first 100 distinct page references in order and then same 100 distinct page references in reverse order. If FIFO page replacement policy is used, how many page faults occur for the above page references? [4]

ii. Consider a paging hardware with a TLB. Assume that the entire page table and all the pages are in the physical memory. It takes 10 milliseconds to search the TLB and 80 milliseconds to access the physical memory. If the TLB hit ratio is 0.6, what is the effective memory access time (in milliseconds)? [2]

(b) i. Consider the following snapshot of a system. Total resources in the system are (3, 4, 4, 5, 5). [4]

	Allocation	Max
	A B C D E	A B C D E
P1	0 1 1 0 0	0 2 1 0 2
P2	1 1 0 2 0	3 2 1 3 1
P3	0 0 0 0 0	0 1 0 1 0
P4	2 1 0 0 2	2 3 1 0 4

Answer the following questions using the banker's algorithm:
a. What are the contents of the matrix need and available?
b. Is the system in a safe state?

ii. What do you mean by thread pool? [2]