Roll No. _____

Pandit Deendayal Petroleum University
School of Technology

Re - Examination, May-2019.

B. Tech. (Computer Engineering/ICT) | **Semester – V**
Date: 21/05/2019 | **Time: 10.00 am to 1.00 pm**
Course Name : Operating Systems | **Course Code : 18CP301T**
Max. Marks: 100

Instructions:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever necessary and mention your assumptions clearly.
3. Write appropriate units, nomenclature and draw neat sketches/schematics, wherever required.
4. Answer all parts of a question continuously.

Q.1 **Answer the Following** **[20]**

1. How are user level threads different from Kernel level threads? [5]
2. What are the responsibilities of fork ( ) system call. [5]
3. Explain multi-level queue scheduling. [5]
4. Define the following terms: [5]
   Deadlock, Starvation, Busy Waiting, Mutual Exclusion, Hold and wait.

Q.2 **Answer the following** **[20]**

1. Under what situations does transition to and from Block state is initiated. [5]
2. Differentiate Internal fragmentation and External Fragmentation. [5]
3. In a computer system where the 'best fit' algorithm is used for allocating jobs to memory partitions, the following situation was encountered. When will the 20K job Complete? [5]

Partition sizes in KB	4K	8K	20K	2K			
Jobs	2K	14K	3K	6K	10K	20K	2K
Time for execution	4	10	2	1	1	8	6

4. What is the meaning of the field caching disabled and protection filed in Page Table Entry? [5]

Q.3 **Answer the following** **[20]**

1. Fill up the blank entries in such a way that Page Table will fit in one page in single level paging. [5]

Virtual Address Space	Page Size	Page Table Entry
4 MB	4 KB	
4 GB	128 KB	
256 MB		4 B
16 GB		4 B
4 GB		4 B

2. Explain working set algorithm. Let the window size be 4. Calculate the average frame requirement for the following reference string [5]
   a. 1, 2, 3, 1, 2, 4, 1, 4, 2, 1, 5, 1, 2, 4, 2, 1
   b. a, d, e, c, c, d, b, c, e, c, e, a, d

3. A system uses FIFO policy for page replacement. It has 4 page frames with no pages loaded to begin with. The system first accesses 100 distinct pages in some order and then accesses the same 100 pages but now in the reverse order. How many page faults will occur? Justify your answer with reason. [5]

4. Differentiate segmentation and paging. [5]

Q.4 **Answer the following** **[20]**

1. Explain deadlock detection and recovery. [4]
2. Consider the following table with process no, priority, Arrival time and Burst time. Fill up the remaining entries considering non-preemptive and preemptive priority scheduling algorithm. [8]

P. No.	Priority	Arrival Time	Burst Time	Completion Time	Turn Around Time	Waiting Time	Response Time
1	1 (L)	0	2				
2	3	2	4				
3	6	1	5				
4	10	4	3				
5	8	3	4				
6	14 (H)	6	1				
7	9	5	6				

3. Explain any two disk scheduling algorithms. [8]

Q.5 **Answer the following:** **[20]**

1. List and explain file attributes and operations on a file. [7]
2. List the Information required for accessing a file and explain different file access methods? [3]
3. Consider 4 jobs P1, P2, P3 and P4 arriving in ready queue in the same order at time=0. IF BT requirements of these jobs are 4,1,8,1 respectively, what is CT of P3, assuming RR with TQ=1 and TQ=2. [5]
4. Explain the basic working principle of page replacement algorithm and how it is useful in LRU and Optimal. Explain with suitable example. [5]