SOMAIYA
VIDYAVIHAR UNIVERSITY

Maximum Marks:30	Semester: July 2023 – Oct 2023 Examination: In-Semester Examination		Duration :1hr 15min	
Programme code: 02				
Programme: B.Tech		Class: TY	Semester: V (SVU 2020)	
Name of the Constituent College: K. J. Somaiya College of Engineering			Name of the department: COMP	
Course Code: 116U01C503		Name of the Course: Operating System		

Question No.		Max. Marks	CO Mapped	BT Level
Q1 a)	With respect to the system software, describe Linker and Loaders. **OR** Explain the System Boot Process.	5	CO1	RE

Q1 b)	With respect to Process creation, Examine the program given below and predict the output for the program with proper justification.
	
	 ```#include <stdio.h>```
	 ```#include <sys/types.h>```
	 ```#include <unistd.h>```
	 ```void forkexample()```
	 ```{```
	 ``` int x =10;```
	 ``` if (fork() == 0)```
	 ``` printf("Child has x = %d\n", ++x);```
	 ``` else```
	 ``` printf("Parent has x = %d\n", --x);```
	 ```}```
	
	 ```int main()```
	 ```{```
	 ``` forkexample();```
	 ``` return 0;```
	 ```}```
		5	CO1	AN

Q2	Consider a set of 6 processes whose arrival time and CPU time needed are given below:	10	CO2	AP

```c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
void forkexample()
{
  int x =10;
  if (fork() == 0)
    printf("Child has x = %d\n", ++x);
  else
    printf("Parent has x = %d\n", --x);
}

int main()
{
  forkexample();
  return 0;
}
```

Process	Arrival Time (ms)	Burst Time (ms)
P1	0	8
P2	1	4
P3	2	2

P4	3	1
P5	4	3
P6	5	2

1. If the CPU scheduling policy is Shortest Remaining Time First. Illustrate the scheduling policy with the help of Gantt chart. Compute Average Waiting Time and Average Turnaround time.
2. What will be the Average Waiting Time and Average Turnaround time if the scheduling policy is Round Robin? Assume quantum time for Round-Robin as 2 ms.

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Q3	Differentiate between User level Threads and Kernel Level Thread With respect to thread scheduling, discuss Thread Creation and distinguish between Thread termination and Thread Joining.	10	CO2	AN

OR

Discuss the various components of the Process Control Block.

In the following process state transition diagram for a uniprocessor system, assume that there are always some processes in the ready state:
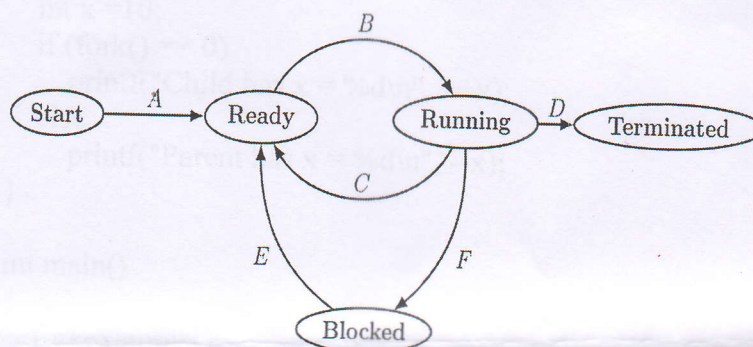
Now consider the following statements:

1. If a process makes a transition D, it would result in another process making transition A immediately.
2. A process P2 in a blocked state can make transition E while another process P1 is in a running state.
3. This OS uses preemptive scheduling
4. This OS uses non-preemptive scheduling

Examine which of the above statements are true and why? Justify your answer.