COMSATS University Islamabad, Lahore Campus
Block–C, Department of Computer Science
COMSATS University Islamabad, Lahore Campus 1.5KM Defence Road, Off Raiwind Road, Lahore

Sessional – I Examination – Semester Spring 2021

Course Title:	Operating Systems			Course Code:	CSC322	Credit Hours:	3(2,1)
Course Instructor/s:	Nadeem Ghafoor Chaudhry			Programme Name:	BS Computer Science		
Semester:	5th	Batch:	SP19-BCS	Section: B,C	Date:	30th March 2021	
Time Allowed:	**60 Minutes**			**Maximum Marks:**	**25**		
Student's Name				Reg. No.			

Important Instructions / Guidelines:

- Answer all questions.
- Do not give multiple answers for a question. Clearly cross out what you do not want me to read.
- Do not make multiple submissions.

Q1) **[5+5 marks]**

PID	Arrival Time	Burst Time	Priority
1	1	5	5
2	2	4	4
3	3	1	5
4	4	2	2
5	5	1	3
6	7	6	6

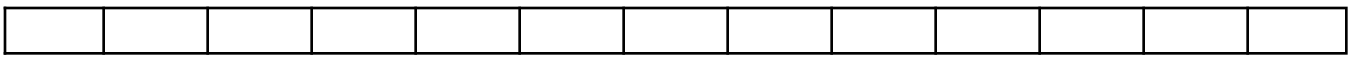
Use the data provided in the above table to draw Gantt Charts and calculate average turnaround time using

a) Shortest Remaining Time First (SRTF)
b) Priority

Keep in mind:

a) Both are pre-emptive
b) For SRTF if there is tie use Priority to break the tie
c) For Priority scheduling if there is tie use BurstTime/RemainingTime to break the tie.
d) The system is dual core, i.e two processes can execute in parallel so you will draw two Gantt Charts for each case like so

Core0



Core1

1 2 3 4 5 6 7 8 9 10 11 12

Q2) **[5 marks]** Why is it that a C program compiled on Linux won't run on a Windows platform but a Java program compiled on Linux would run on a Windows platform. Draw diagram to support your answer.

Q3) **[5+4+1 marks]** Assume that there are no errors in the following code and program executes normally.

```
 7 int main(void) {
 8    char mybuf[100];
 9    pid_t childpid;
10    int fd[2];
11    if (pipe(fd) == -1) {
12       perror("Failed to create the pipe");
13       return 1;
14    }
15    printf ("This question is about pipe\n");
16    childpid = fork();
17    if (childpid) {
18       close(fd[1]);
19       read(fd[0], mybuf, 100);
20       fprintf(stderr, "I am process %ld and I read this from pipe: %s\n",
21            (long)getpid(), mybuf);
22    }
23    else   {
24       close(fd[0]);
25       sprintf (mybuf, "I am process %ld \n", (long)getpid());
26       write(fd[1], mybuf, sizeof(mybuf));
27    }
28    return 0;
29 }
```

The above code is compiled into an executable called Q3.exe and when it executes its process ID is 5678 and the PID of its child is 5679.

a) Write the output produced and a brief description of what the code is doing, especially lines 11 and 16 to 27.
b) Make a diagram of File Descriptor Table(s) to support your answer.
c) Would it make any difference to the program if lines 18 and 24 are commented out?