

Università degli studi “Roma Tre”

A.Y: 2021/2022

Teaching: Sistemi Operativi

Course: Ingegneria Informatica

Exam session: 21/02/2022

Lecturer: Romolo Marotta

Maximum score: 31 points

STUDENT ID _____ Last Name _____ First Name _____

It is recommended that you write your surname and name on this sheet and use it as a folder to contain the answer sheets. If you consider a question ambiguous, write down your interpretation and respond accordingly.

Question 1 (6 points)

Describe First-Come-First-Serve scheduling policy and discuss its pros and cons.

Question 2 (6 points).

Describe the following methods for file access: sequential, direct and indexed.

Question 3 (9 points).

Describe the Belady’s anomaly. Does it affect FIFO, LRU and Optimal page-replacement policy? Explain your answer.

Given a memory with 4 frames, how many page faults are generated by the abovementioned algorithm with the following trace:

0,8,4,9,4,1,0,9,4,3,5,6,5,4,8,5

Question 4 (10 points)

Write a C function with the following interface:

```
int count_valid_string (char *filename, char *charset, int n).
```

This function must launch a number of threads / processes equal to n to read a sequence of strings from the binary file *filename* and count how many of these contain all the chars in *charset*. Finally, the function prints to standard output and returns the total number of identified strings contained in the file.

Each line is made of 50 chars including the line break.

The publication of the result via Web will take place anonymously using the serial number. To have your exam grade published on the course website, you must sign the following authorization.

The undersigned, pursuant to law 675 of 31/12/96, authorizes the lecturer to publish the results of the exam on the bulletin board and / or on the Web. In faith

Legible signature: _____