

## **Full Student Name:**

Grau en Enginyeria Informàtica de Gestió i Sistemes d'Informació

Operating Systems

March 23<sup>rd</sup> 2018

**You will be marked as written at each question. You have to write your answers on the reserved blank space. No answers written out of place will be taken into account. You could not use a pencil for your answers.**

- 1. Write some Operating System functionalities (at least 5) (2 POINTS)**

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### **2. Enumerate some (at least 3) Scheduling techniques (1 POINT)**

### **3. Explain which is the purpose of commands *PUSHD* and *POPD* in a Linux Operating System (these commands should be executed on command line) (1 POINT)**

**4. Done file “TABLE.TXT” with the attached content (1 POINT)**

1	2	3
4	5	6
7	8	9

**Write which will be the result if we execute the attached script:****`gawk 'BEGIN{sum=0};{sum+=$1};END{print sum}' ./TABLE.TXT`****5. Explain the objective of *TOUCH FILENAME* command? (1 POINT)****6. If you want to share information between a pair of processes using PIPES. Write the number of pipes you need for a bidirectional communication. Write a justification for your answer. (1 POINT)**

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7. On a connection oriented client-server communication write the main functions (properly ordered) to send information from client to server, and then echo back the same information from server to client. Write only the name of the functions, no the parameters; do not declare variables. Write **ONLY** the functions involved with the socket used in the communication nothing else(1 POINT)

8. Which command could you use to print on screen **JUST ONLY** the first 20 lines of a file (shell scripting); and **JUST ONLY** the last 20? (1 POINT)

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**9. Which is the purpose of the sem\_unlink function? When should the function be executed?(1 POINT)**

**10. Write the list of states in which a process can be. Write all the transitions you can have (from one state to another) (1 POINT)**

**11. Which is the role of a SCHEDULER? And the role of a DISPATCHER? (1 POINT)**

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**12. Write at least 5 types of information you can find on PCB (Process Control Block)? (1 POINT)**

**13. Write two scheduling criteria from the ones we learned. Explain how they work (2 POINTS)**

14. When you want to use the function `BIND()`; the address parameter could be set in two different ways: `SERVER.SIN_ADDR.S_ADDR=HTONL(INADDR_ANY);` or `...`. Could you explain which the objective of both solutions is? (1 POINT)

15. On a non-connection oriented client-server communication write the main functions (properly ordered) to send information from client to server, and then echo back the same information from server to client. Write only the name of the functions, no the parameters; do not declare variables. Write ONLY the functions involved with the socket used in the communication (nothing else)(1 POINT)

16. From the list of function calls written below with function **SOCKET()** tell which ones are correct and why: (1 POINT)

- A. **SOCK=SOCKET(PF\_INET, SOCK\_DGRAM, IPPROTO\_UDP)**
- B. **SOCK=SOCKET(PF\_INET, SOCK\_STREAM, IPPROTO\_TCP)**
- C. **SOCK=SOCKET(PF\_INET, SOCK\_DGRAM, IPPROTO\_TCP)**
- D. **SOCK=SOCKET(PF\_INET, SOCK\_STREAM, IPPROTO\_UDP)**

17. Explain which the objectives of the functions **SEM\_POST** and **SEM\_WAIT** are? Which are the parameter/s used on the functions? (1 POINT)

18. Which is the purpose of the system call **LISTEN** on a connection oriented communication? (1 POINT)