CS 303 - OPERATING SYSTEM CONCEPTS (3 CREDITS)

ASSIGNMENT 01

Answer **ALL** Questions

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1. Explain the difference between system software and application software.
2. What is an operating system (OS)?
3. What are the three main purposes of an OS?
4. Provide the most well-known examples of OSs.
5. Compare and contrast the difference between Windows and Linux OSs.
6. Explain the role of an OS as a resource allocator.
7. Explain the role of an OS as a control program.
8. What does a bootstrap program do?
9. State and explain the functionalities of a bootstrap program.
10. How an OS kernel differs from an application program?
11. What is the purpose of an interrupt?
12. How does an interrupt differ from a trap?
13. Can traps be generated intentionally by a user program? If so, for what purpose?
14. How does an OS preserve the state of the CPU?
15. Explain the functionality of a system call.
16. Rank the following storage systems according to their speed, cost, and volatility:
    a. Hard-disk drives
    b. Optical disk
    c. Registers
    d. Nonvolatile memory
    e. Main memory
    f. Cache
    g. Magnetic tapes

17. Discuss the difference between the main memory and secondary storage.
18. What are the advantages of solid-state drives (SSD) over hard drives (HD)?
19. Briefly explain how a device driver engages to manage I/O operations.
20. Explain how caching works in searching for information.
21. What is a distributed system?
22. Compare and contrast a single processor system and a multiprocessor system.
23. What is the major difference between asymmetric multiprocessing and symmetric multiprocessing?
24. Explain how multiprogramming is efficient in working with jobs.
25. Explain the term “Timesharing” in the OS context.
26. State the two-mode of operations in dual-mode operations and explain the procedure of transition from user mode to kernel mode when a system call occurs.
27. Explain how a timer can be used to prevent infinite loops.
28. State the process management activities, the memory management activities, and the storage management activities that an OS is responsible.
29. Briefly explain the terms “Buffering”, “Caching”, and “Spooling” in memory management.
30. Discuss the main advantages and disadvantages of open-source OSs.