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University Examinations 2023/2024

**THIRD YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF COMPUTER SECURITY AND FORENSICS**

CCF 3351: ADVANCED LINUX/ UNIX SYSTEMS ADMINISTRATION

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

- a) Explain how Debian GNU/Linux is different from Ubuntu. Name two aspects
(4 Marks)
- b) What are the most common environments/platforms Linux is used for? Name three different environments/platforms and name one distribution you can use for each
(4 Marks)
- c) You are planning to install a Linux distribution in a new environment. Name four things that you should consider when choosing a distribution
(4 Marks)
- d) Name three devices that the Android OS runs on, other than smartphones
(3 Marks)
- e) Explain three major advantages of cloud computing
(3 Marks)



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- f) Considering cost and performance, which distributions are mostly suitable for a business that aims to reduce licensing costs, while keeping performance at its highest? Explain why (4 Marks)
- g) Discuss are the major advantages of the Raspberry Pi and explain which functions can support modern businesses (4 Marks)
- h) What range of distributions does Amazon Cloud Services and Google Cloud offer? Name at least three common ones and two different ones (4 Marks)

QUESTION TWO (20 MARKS)

- a) For each of the following commands, identify whether it is associated with the Debian packaging system or the Red Hat packaging system: (5 Marks)
 - i. Dpkg
 - ii. Rpm
 - iii. apt-get
 - iv. yum
 - v. dnf
- b) Which command could be used to install Blender on Ubuntu? After installation, how can the program be executed? (2 Marks)
- c) Which application from the LibreOffice suite can be used to work with electronic spreadsheets? (2 Marks)
- d) Which open-source web browser is used as the basis for the development of Google Chrome? (2 Marks)
- e) SVG is an open standard for vector graphics. Which is the most popular application for editing SVG files in Linux systems? (2 Marks)
- f) For each of the following file formats, write the name of an application able to open and edit the corresponding file: (5 Marks)
 - i. Png



- ii. Doc
 - iii. Xls
 - iv. Ppt
 - v. Wav
- g) Which software package allows file sharing between Linux and Windows machines over the local network? (2 Marks)

QUESTION THREE (20 MARKS)

- a) You know that configuration files are kept even if the associated package is removed from the system. How could you automatically remove the package named cups and its configuration files from a DEB based system? (3 Marks)
- b) Suppose you have many TIFF image files and want to convert them to JPEG. Which software package could be used to convert those files directly at the command line? (3 Marks)
- c) Which software package do you need to install in order to be able to open Microsoft Word documents sent to you by a Windows user? (3 Marks)
- d) What are — in a nutshell — the “four freedoms” as defined by Richard Stallman and the Free Software Foundation? (5 Marks)
- i. freedom 0
 - ii. freedom 1
 - iii. freedom 2
 - iv. freedom 3
- e) What does the abbreviation FLOSS stand for? (2 Marks)
- f) You have developed free software and want to ensure that the software itself, but also all future works based on it, remain free as well. Which license do you choose? (2 Marks)
- i. CC BY
 - ii. GPL version 3



- iii. 2-Clause BSD License
 - iv. LGPL
- g) Which of the following licenses would you call permissive, which would you call copyleft? (2 Marks)
- i. Simplified BSD License
 - ii. GPL version 3
 - iii. CC BY
 - iv. CC BY-SA

QUESTION FOUR (20 MARKS)

- a) You have written a web application and published it under a free license. How can you earn money with your product? Name three possibilities (4 Marks)
- b) Use the man command to find out what each command does: (4 Marks)
- i. pstree
 - ii. top
 - iii. vmstat
 - iv. ps
- c) According to the extensions, which of the following tools(tar, gzip, bzip2, xz) were used to create these files: (4 Marks)
- i. archive.tar
 - ii. archive.tgz
 - iii. archive.tar.x
- d) Explain how an admin can troubleshoot the boot loader using the command prompt (4 Marks)
- e) Give four guidelines for helping users to create a secure password (4 Marks)



QUESTION FIVE (20 MARKS)

- a) Explain the role of the following linux directories: (4 Marks)
- i. /bin
 - ii. /sbin
 - iii. /var
 - iv. /home
- b) Device files for hard drives are represented based on the controllers they use — we saw /dev/sd* for drives using SCSI (Small Computer System Interface) and SATA (Serial Advanced Technology Attachment), but (4 Marks)
- i. How were old IDE (Integrated Drive Electronics) drives represented?
 - ii. ◦ And modern NVMe (Non-Volatile Memory Express) drives?
- c) Explain the role of The /proc virtual (or pseudo) filesystem (4 Marks)
- d) Define swap in linux systems (4 Marks)
- e) Describe the nature of information found in the following directories: (4 Marks)
- i. /dev
 - ii. /sys
 - iii. /etc
 - iv. /usr

