



SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
Second Year, Second Semester Examination – 2017
HNDIT2402 Free and Open Source Systems-Answers

Answer Script

Question 1

I. Select the most appropriate answer

1. b
2. c
3. c.
4. c
5. a
6. c
7. c
8. a
9. d
10. a

(2x10=20

marks)

II. State whether the following sentences are true or false

- a) In Linux ***tar*** command is used to create compressed archives that can easily be moved around, from disk to disk, or computer to computer. (.....T.....)
- b) Nonreciprocal Free licenses allow subsequent users to use, modify, and redistribute the code with source code (.....F.....)
- c) A proxy service provides management and control over Internet access. (.....T.....)
- d) Cron is a Unix, Solaris utility that allows tasks to be automatically run in the background at regular intervals by the cron daemon.(.....T.....)

- e) By using **:w!** <enter key> command can quit the vi without making any changes in file. (.....F.....) (5 marks)

(Total 25 marks)

Question 02

- I. Define the term Open Source Software (2 marks)
- Open-source software is computer software with its source code made available and licensed with a license in which the copyright holder provides the rights to study, change and distribute the software at no cost to anyone and for any purpose.*
- II. Write four concepts which are using in FOSS business model (4 marks)
1. *Selling the FOSS for low cost*
 2. *Providing the FOSS total free and selling services*
 3. *Dual-licensing*
 4. *FOSS is total free and proprietary extensions*
 5. *Donations to developers*
- Any 4 give 4 marks*
- III. Briefly explain the concept of “Dual Licensing” (4 marks)
- *Offer open source products to those who are developing open source software, or to individual end users*
 - *Profit oriented others may be required to pay for a commercial license.*
- Or*
- *One version is total free (individual users)*
 - *Another version is selling for money (Companies)* *2 marks per each*
- IV. Briefly explain following terms which are used in the Linux architecture (6 marks)
- a) *Shell*
- The original and most powerful Linux user interface*
- An interface between the user and the kernel.*
- text-based command-line interpreter.*
- b) *Kernel-Hub of the operating system*
- c) *System Calls*
- system call is how a program requests a service from an operating system's kernel*
- 2 marks per each*
- V. Name three Shell types in Linux (3 marks)

Bash

sh

csch and tcsh

Korn shell, or ksh

Any 3 shell 3 marks

VI. Write short notes on following topics (6 marks)

a) GNU project

- *In 1984 by Richard Stallman*
- *A project to develop a complete operating system*
- *Give computer users freedom and control in their use of their computers*
- *GNU Project Outcome*
 - *Unix Like OS*
 - *Developed essential utilities*
 - *Editor*
 - *Compilers*
 - *Debugger*

- *Unix-like computer operating system*
- *Developed by the GNU Project.*
- *Initiated by Richard Stallman in 1983*
- *But no stable release of GNU yet*

Any 03, 03 marks

b) Linux Advantages

- *Can view source code*
- *Can Change and redistribute source code*
- *Reduce software licensing cost and effort*

Any possible advantages, 03 marks

(Total 25 marks)

Question 03

I. What is the usage of following two terminal commands in Linux (4 marks)

a) *Free*

To display free and used memory

02 marks

b) *Top*

Linux displays the running processes on the system.

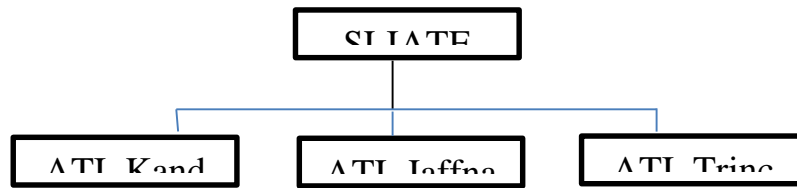
It displays a listing of the most CPU-intensive tasks on the system.

It can sort the tasks by CPU usage, memory usage and runtime.

If we would like to get a snapshot of what is currently happening on the system we may use a program called top.

Any 02 answers, 02 marks

II. Assumed you have opened the terminal and now you are in your home directory



a) Write down Linux commands to create the above directory structure. (5 marks)

- *Mkdir SLIATE 1 mark*
- *Cd SLIATE 2 marks*
- *Mkdir ATI_Kandy,ATI_Jaffna,ATI_Trinco 2 marks*

b) Write down Linux commands to view the contents of ATI_Kandy folder. (2 marks)

- *Cd SLIATE/ATI_Kandy*
- Or*
- *Cd ATI_Kandy 1 mark*
- *And type ls 1 mark*

c) What is the output if you type “pwd” inside ATI_Kandy folder (2 marks)

It will display the location which is ATI_Kandy directory is exist

d) Write down Linux commands to delete the ATI-Kandy folder. (2 marks)

Rmdir ATI_Kandy

e) Assumed you have word document called “*studentinfor.doc*” inside ATI_Jaffna directory.

Write down Linux commands to copy it to the ATI-Trinco directory.

Go to ATI_Jaffna directory 1 mark

CD ATI_Jaffna

Cp studentinfor.doc full path for ATI_trinco directory

Cp studentinfor.doc home/SLAITE/ATI_Trinco 3 marks (4 marks)

III. Assumed you have opened the terminal and now you are in your home directory. In your home directory there is a text file named as *atidata.txt*. (6 marks)

a) Write a command to find the word *computer* in *atidata.txt* file using **grep**.

grep 'computer' atidata.txt

b) How to open *myInfo.txt* file in append mode using **cat** command.

`cat >> myInfo.txt`

- c) Rename the file *atidata.txt* as *atiinformaton.txt* using command.

`Mv atidata.txt atinformation.txt`

2 marks per each

(Total 25 marks)

Question 04

- I. What is the purpose of text editors in Linux? (2 marks)

to create and edit text files, configuration files etc

- II. List any four advantages of **vi** editor in Linux (4 marks)

Speed : Do more with fewer keystrokes

Simplicity : No dependence on mouse/GUI

Availability : Included with most Unix / Linux Distro

Can create and edit text documents

- III. **vi** editors in Linux has three modes namely Command mode, Input mode and Last-line mode.

How will you get to them by pressing keys (3 marks)

to put in input mode press I/i A/a O/o R/r C

to put in command mode press Escape key

to put in Last-line mode press Escape mode then press colon (:)

- IV. What is the purpose of process management in Linux Operating System? (4 marks)

– *A program is a series of instructions that tell the computer what to do.*

– *When we run a program, those instructions are copied into memory and space is allocated for variables.*

– *This running instance of a program is called a process.*

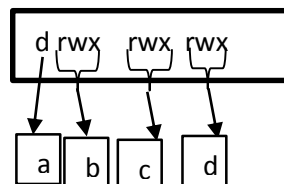
– *Every process there is process life cycle. Process are generated, execute and then terminate.*

– *Process are consume system resources such as memory and CPU.*

– *Linux, like most modern OS's is a multitasking operating system, therefore process management is necessary.*

(Any 04 answers, 04 marks)

- V. Identify a,b,c,d in flowing figure (4 marks)



A Type of file

B User/Owner permission

C Group permission

D owner permission

VI. Write down the output of following permission commands for *atiinfo.txt* file (8 marks)

(Hint : *atiinfo.txt* – 0640)

a) Chmod 766 *atiinfo.txt*

To give read write execute permission to users, read, write permission for group and others

b) Chmod o+r *atiinfo.txt*

To provide read permission to others

c) Chmod u-w *atiinfo.txt*

To remove write permission from users

d) Chmod a+rx *atiinfo.txt*

To provide read,write and execute permission to all

2 marks per each

(Total 25 marks)

Question 05

I. What are the functionalities of samba server? (4 marks)

Samba is an extremely useful networking tool for anyone who has both Windows and Unix systems on his network. Running on a Unix system, it allows Windows to share files and printers on the Unix host, and it also allows Unix users to access resources shared by Windows systems.

II. Write two reasons to implement a proxy server in your computer network. (4 marks)

- *To perform NAT functions. A proxy server can process and execute commands on behalf of clients that have private IP addresses.*
- *To allow Internet access to be controlled having a centralized point of access allows for a great deal of control over the use of the Internet.*
- *Significantly improves performance: Performance is improved particularly in environments such as a universities, schools, companies, etc., where there is a great likelihood that more than one user might retrieve the same page.*
- *Reduces demands on Internet connections: Because there are fewer requests to the Internet when a caching proxy server is in use, there is a reduced demand on the Internet connection. In some cases, this results in a general speed improvement*

Any 2 points,4 marks

III. Following segment displays ACCESS_CONTROL section of the squid.conf

```
#  
# Add this to the bottom of the ACL section of squid.conf  
#  
acl home_network src 192.168.1.0/24  
acl business_hours time M T W H F 9:00-17:00  
acl RestrictedHost src 192.168.1.23  
#  
# Add this at the top of the http_access section of squid.conf  
#  
http_access deny RestrictedHost  
http_access allow home_network business_hours
```

Briefly explain the use above configurations in squid.conf file in Proxy server. (4 marks)

You can allow only business hour in five week days can access from the home network, while always restricting access to host 192.168.1.23.

IV. Briefly explain following mail server services (4 marks)

a) Postfix

Postfix is a free and open-source mail transfer agent (MTA) that routes and delivers electronic mail 2 marks

b) Devcot

As an IMAP and POP3 server, Dovecot provides a way for Mail User Agents (MUAs) to access their mail. So when a user's MUA contacts the mail server, the software which answers that request is an IMAP or POP3 server. 2 marks

V. What is web server? Name two open source web servers. (4 marks)

A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Dedicated computers and appliances may be referred to as Web servers as well.

2 marks

Apache HTTP server

NGINX

marks

- VI.** Briefly explain the functionality of DHCP server (5 marks)

DHCP (Dynamic Host Configuration Protocol) is a network service that enables clients to obtain network settings (IP Address, Subnet Mask, Default Gateway, DNS Server, Hostname and Domain) automatically from a central server

The DHCP client sends a broadcast request to find the DHCP server and the DHCP server in the subnet responds with an IP address (and other common network parameters) from a pool of IP addresses

(Total 25 marks)