



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS**  
**UNIVERSITY EXAMINATION FOR THE DIPLOMA IN LINUX ENGINEERING**  
**1<sup>ST</sup> YEAR 1<sup>ST</sup> SEMESTER 2013/2014 ACADEMIC YEAR**  
**CENTRE: KISUMU**

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**COURSE CODE: ICT 2112**

**COURSE TITLE: LINUX/UNIX SYSTEM ADMINISTRATION**

**EXAM VENUE:**

**STREAM: Dip. Linux Engineering**

**DATE: 3/12/2013**

**EXAM SESSION: 2.00 – 3.30 PM**

**TIME: 1 ½ HOURS**

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**Instructions:**

- 1. Answer question 1(Compulsory) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

## QUESTION ONE

- (a) “System administration covers all the things that you have to do to keep a computer system in usable order”.
- (i) Do you agree with the above statement? Explain. [4 Marks]
  - (ii) How does the above statement apply to the case of UNIX / Linux? [2 Marks]
- (b) “There is no one official Linux distribution, so different people have different setups and many people have a setup they have built up themselves.”
- (i) Explain your understanding of the above statement. [2 Marks]
  - (ii) Name FOUR examples of Linux distribution that you know. [4 Marks]
- (c) Explain the following as applies to UNIX/Linux [8 Marks]
- (i) Linux ISO
  - (ii) Shell
  - (iii) Kernel
  - (iv) X Window
- (d) Demonstrate the use the following Linux commands. [4 Marks]
- (i) `chmod`
  - (ii) `grep`
  - (iii) `ls -l`
  - (iv) `ifconfig`
- (e) What significant contribution did *Linus Torvalds* make to operating systems? [2 Marks]
- (f) Briefly compare and contrast the key features of Linux with any Microsoft Windows OS. [4 Marks]

## QUESTION TWO

[20 MARKS]

- (a) Explain what happens when a user is added to a Unix/Linux system in terms of files/directories that have to be created or modified. Give examples and explanations of the commands that are used to make these changes. [6 Marks]
- (b) Explain how file permissions operate in a Unix/Linux environment. How do you display what file permissions are associated with a file called anyfile. How you would arrange for anyfile to have the following permissions: only the file owner can read/write the file, no other access if provided only the file owner and members of the owner's group can execute the file, and all users can read the file. [8 Marks]
- (c) Draw a diagram of the standard Linux/Unix file system hierarchy and explain the role of the bin, etc, lib, tmp and dev directories. Explain the notion of links and why it is useful to have more than one name for a file. [6 Marks]

### QUESTION THREE

[20 MARKS]

Examine the following extract from a **httpd.conf** file on an Apache server of a company that provides web hosting services.

```
<Virtual Host *:80>
  ServerAdmin
  admin@wwwhost.net
  DocumentRoot /usr/local/www/data
  ServerName wwwhost.net
  ErrorLog /var/log/www/error_log
  CustomLog /var/log/www/access_log common

  <Directory />
    Options -Indexes
    Order allow, deny
    Allow from all
  </Directory>
</VirtualHost>

<Virtual Host *:80>
  ServerAdmin
  support@acme.com.au
  DocumentRoot /home/acme/public_html
  ServerName acme.com.au
  ErrorLog /home/acme/wwwlog/error_log
  CustomLog /home/acme/wwwlog/access_log common

  <Directory />
    Options -Indexes
    Order allow, deny
    Allow from all
  </Directory>
</VirtualHost>

<Virtual Host *:80>
  ServerAdmin
  jason@unixforall.net
  DocumentRoot /home/unixforall/public_html
  ServerName unixforall.net
  ErrorLog /home/unixforall/wwwlog/error_log
  CustomLog /home/acme/wwwlog/access_log common

  <Directory />
    Options -Indexes
    Order allow, deny
    Allow from all
  </Directory>
</VirtualHost>
```

(a) What is the purpose of the `ServerAdmin` directive? [2 Marks]

(i) DocumentRoot (ii) CustomLog

(b) What is the “base” name of this server? [2 Marks]

(c) How many customer sites is this server hosting? [2 Marks]

(d) What instructions should the service provider supply to its customers in regards to installing their web sites? [4 Marks]

(e) The service provider has made a mistake configuring one customer’s virtual site. Which customer and what is the mistake? [4 Marks]

(f) What else does a customer need to do external to the web hosting company to ensure that their web site is accessible from the rest of the Internet? [4 Marks]

## QUESTION FOUR

[20 MARKS]

(a) Differentiate between the following as applies to booting in UNIX / Linux [8 Marks]

(i) Boot Loader and Boot Sector

(ii) LILO and GRUB

(b) Give a Linux command that can be used to; [4 Marks]

(i) Shut down a computer in 20 minutes time

(ii) Install patches

(c) Unix command line interactivity is implemented via the shell

(i) Apart from providing a command line user interface, what are the other primary functions provided by the shell? [4 Marks]

(ii) Describe the processes that occur when the following command is run from the shell? `grep "search string" * | wc -l` [4 Marks]

## QUESTION FIVE

[20 MARKS]

(a) The University system administrator has misconfigured the `dhcpd.conf` file as indicated below:

```
option domain-name          university.ac.ke;
option domain-name-servers  dns.university.ac.ke;
option routers               gateway.university.ac.ke;
default-lease-time          1296000;
max-lease-time               2592000;
authoritative;

subnet 192.168.19.0 netmask 255.255.255.0 {
    range 192.168.50.16 192.168.150.250;
}
```

(i) What has system administrator done wrong? [2 Marks]

(ii) If this error was fixed, how long would a lease from this server be valid for? [2 Marks]

(b) Below is a segment of a bind configuration file.

```
options {
    version          "My Secret Value";
    directory        "/var/bind";
    listen-on        { 192.168.0.1; 192.168.1.1 };
    forwarders        { 100.101.102.103; 100.101.102.106; };
    allow-query        { 192.168.0.0/24; 192.168.1.0/24; localhost; }
    pid-file          "/var/run/named/named.pid";
};
```

(i) What is the purpose of the command statement – **forwarders** [2 Marks]

(ii) What is the purpose of the (**pid-file**) statement? [2 Marks]

(iii) What does the line – **allow-query** – tell about this bind server [2 Marks]

(c) Below is an extract of a SAMBA configuration file.

```
workgroup = SIIS
server string = SIIS Samba Shared Server
hosts allow = 192.168.0. 192.168.40. 127.
security = user
interfaces = 192.168.0.10 127.0.0.1
local master = yes
domain master = no
```

```
[public]
comment = Unix CD Images
path = /pub
browseable = no
writeable = yes
valid users = daniel, siis
force create mode 0777
```

(i) What is the name of the directory share being advertised? [2 Marks]

(ii) Which subset of Samba users are allowed to access this directory share, from what hosts on the network, and with what permissions? [4 Marks]

(iii) What is the purpose of the **force create mode** options in this configuration file? [2 Marks]

(iv) If you were sitting at a Unix Box and wanted to connect to this share how would you go about doing it? [2 Marks]

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