

- Q1.** Unix based Operating System's have a configurable kernel parameter called Tick Rate.
- What is this parameter used for in the OS?
  - List advantages and disadvantages in increasing the tick rate for a given platform

**Marks (5)**

- Q2.** Unix command line interactivity is implemented via the shell
- Apart from providing a command line user interface, what are the other primary functions provided by the shell?
  - Describe the processes that occur when the following command is run from the shell?  
`grep "search string" * | wc -l`

**Marks (5)**

- Q3.** Following is the output of a **traceroute** command run from a workstation. What does this tell you about the network between the host and the destination host?

Tracing route to `www.freebsd.org` [216.136.204.117] over a maximum of 30 hops:

```

1      2 ms      1 ms      2 ms  192.168.100.1
2      30 ms     27 ms     30 ms  loop0.lns1.mel4.internode.on.net [150.101.212.16]
3      29 ms     32 ms     26 ms  gi0-3.cor1.mel4.internode.on.net [150.101.212.57]
4     188 ms    191 ms    191 ms  pos2-3.bdr1.syd7.agile.on.net [150.101.120.122]
5     193 ms    191 ms    192 ms  pos2-1.bdr1.sjc2.internode.on.net [203.16.213.185]
6     204 ms    187 ms    189 ms  exchange-cust1.sv1.equinix.net [206.223.116.16]
7     188 ms    192 ms    192 ms  ge-2-0-0-p233.msr2.sc5.yahoo.com [216.115.107.35]
8     189 ms    191 ms    192 ms  ge-8-16.bas2.sc5.yahoo.com [66.163.160.214]
9     196 ms    195 ms    202 ms  www.freebsd.org [216.136.204.117]

```

Trace complete.

**Marks (5)**

- Q4.** What do the following three lines from a **tcpdump** output represent in terms of network transactions. Describe the meaning of each of the highlighted fields.

```

15:19:00.337420 IP 136.186.228.20.36919 > 136.186.229.16.80: S 535825765:535825765(0) win 5840 <mss
1460,sackOK,timestamp 393506925 0,nop,wscale 2>
15:19:00.337616 IP 136.186.229.16.80 > 136.186.228.20.36919: S 2449429781:2449429781(0) ack
535825766 win 65535 <mss 1460,nop,wscale 1,nop,nop,timestamp 3015393277 393506925,nop,nop,sackOK>
15:19:00.337641 IP 136.186.228.20.36919 > 136.186.229.16.80: . ack 1 win 1460 <nop,nop,timestamp
393506925 3015393277>

```

**Marks (10)**

- Q5.** We want to configure a FreeBSD machine as an IP Router.
- Is it necessary to re-compile the kernel – Why/Why Not?
  - Is routing enabled by default – Why/Why Not?
  - List some reasons why you would implement a router in a home or small business implementation

**Marks (10)**

- Q6.** HET306 student Warrop Harren has misconfigured his `dhcpd.conf` file. The relevant portions of this file are:

```
option domain-name          mycompany.com;
option domain-name-servers dns.mycompany.com;
option routers              gateway.mycompany.com;
default-lease-time         1296000;
max-lease-time             2592000;
authoritative;

subnet 192.168.100.0 netmask 255.255.255.0 {
    range 192.168.100.16 192.168.200.250;
}
```

- What has Warrop done wrong?
- If this error was fixed, how long would a lease from this server be valid for?
- Describe the differences between `default-lease-time` and `max-lease-time`?

**Marks (10)**

- Q7.** Attached 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";
};
```

- What is the purpose of the command statement – `forwarders`
- What is the purpose of the (`pid-file`) statement?
- What does the line – `allow-query` – tell about this bind server
- If the `/etc/resolv.conf` file on the local machine is configured as follows, would an `nslookup` on the DNS Server work – Why/Why Not?

```
nameserver localhost
```

**Marks (10)**

- Q8.** Look at the following segment of a SAMBA configuration file.

```
workgroup = HET306
server string = HET306 Samba Shared Server
hosts allow = 192.168.0. 192.168.10. 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 = jbut, het306
    force create mode 0777
```

- What is the name of the directory share being advertised?
- Which subset of Samba users are allowed to access this directory share, from what hosts on the network, and with what permissions?

- c) What is the purpose of the **force create mode** options in this configuration file? What is the overall effect?
- d) If you were sitting at a Unix Box and wanted to connect to this share how would you go about doing it?

**Marks (10)**

**Q9.** 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 “base” name of this server?
- b) How many customer sites is this server hosting?
- c) What instructions should the service provider supply to its customers in regards to installing their web sites?
- d) The service provider has made a mistake configuring one customer’s virtual site. Which customer and what is the mistake?
- e) 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?

**Marks (10)**