Section1:

Q1

a) Ping:

Address	Max RTT	Min RTT	Avg RTT
iitrpr.ac.in	0.111 ms	0.031 ms	0.073 ms
google.com	166.493 ms`	47.962 ms	83.041 ms
google.co.in	56.389 ms	40.257 ms	49.012 ms
gmail.com	60.520 ms	42.426 ms	46.029 ms
facebook.com	42.064 ms	38.296 ms	39.805 ms
wikipedia.org	327.606 ms	93.696 ms	134.460 ms
India.gov.in (100% packet loss)			
nationalgeographic.com	83.108 ms	75.206 ms	77.178 ms
Nkn.gov.in (100% packet loss)			
Irctc.co.in (100% packet loss)			

b)

Address	Percentage packet loss
iitrpr.ac.in	0%
google.com	0%
google.co.in	0%
gmail.com	0%
facebook.com	0%
wikipedia.org	0%
India.gov.in	100%

nationalgeographic.com	0%
Nkn.gov.in	100%
Irctc.co.in	100%

c) The default size of the Ping packet sent is 56 bytes of data.
The amount of packets received is equal to the percentage of packet lost multiplied by amount of packets sent.
Computing RTT and packet loss percentage for default packet size of 100 bytes.

Address	Max RTT	Min RTT	Avg RTT	% Packet Loss
iitrpr.ac.in	0.498 ms	0.019 ms	0.061 ms	0%
google.com	103.269 ms	44.030 ms	48.639 ms	0%
google.co.in	91.984 ms	44.176 ms	55.854 ms	0%
gmail.com	204.301 ms	46.407 ms	76.515 ms	0%
facebook.com	61.485 ms	41.695 ms	47.764 ms	0%
wikipedia.org	289.374 ms	90.622 ms	104.913 ms	0%
India.gov.in				100%
nationalgeographic.com	115.105 ms	79.879 ms	81.954 ms	0%
Nkn.gov.in				100%
Irctc.co.in				100%

d) Traceroute command prints the path packet takes to reach the destination from the source. It describes all the paths taken by a package to reach the destination host.
The source of all the traceroute is the same, thus the first ip address in all calls of traceroute is also the same.
If on two different traceroute calls the packet follows the same path upto some hops then the traceroute call will print the same ip addresses upto that hop.
The common ip addresses belong to the ip address of the routers present on the path.

- Netstat:
    - Netstat -at: lists all tcp ports
    - Netstat -a: to show both listening and non-listening sockets
    - Netstat -au: lists all udp ports
- Ifconfig: command is used to configure the kernel-resident network interfaces.

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 172.21.68.32 netmask 255.255.252.0 broadcast 172.21.71.255
inet6 fe80::6b23:e608:bbbd:991 prefixlen 64 scopeid 0x20<link>
ether 30:e3:7a:0d:ee:9a txqueuelen 1000 (Ethernet)
RX packets 2167675 bytes 2463292304 (2.4 GB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 767799 bytes 125413677 (125.4 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

The marked one shows my pc's ipv4 address

- Hostname: Provides the Local hostname configuration file
  akansha-HP-Pavilion-Notebook
  Hostname -i:
  27.0.1.1

- Nslookup: Nslookup followed by the domain name will display the "A record" (IP Address) of the domain. One can use this command to find the address record for a domain.

  akansha@akansha-HP-Pavilion-Notebook:~/Documents/networks/q4$ nslookup google.com
  Server: 127.0.0.53
  Address: 127.0.0.53#53

  Non-authoritative answer:
  Name: google.com
  Address: 172.217.166.46
  Name: google.com
  Address: 2404:6800:4009:80c::200e

  akansha@akansha-HP-Pavilion-Notebook:~/Documents/networks/q4$ nslookup iitrpr.ac.in
  Server: 127.0.0.53
  Address: 127.0.0.53#53

  Non-authoritative answer:
  Name: iitrpr.ac.in
  Address: 117.252.3.35

akansha@akansha-HP-Pavilion-Notebook:~/Documents/networks/q4$ nslookup nationalgeographic.com
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: nationalgeographic.com
Address: 23.57.12.105

akansha@akansha-HP-Pavilion-Notebook:~/Documents/networks/q4$ nslookup india.govServer: 127.0.0.53
Address: 127.0.0.53#53

** server can't find india.gov: NXDOMAIN
// :(failed attempt

- Traceroute:
  akansha@akansha-HP-Pavilion-Notebook:~/Documents/networks/q4$ traceroute google.com
  traceroute to google.com (216.239.34.117), 64 hops max
  1 172.21.68.3 1.284ms 1.200ms 1.372ms
  2 103.118.50.2 3.546ms 2.813ms 1.169ms
  3 118.185.199.190 8.978ms 8.023ms 7.832ms
  4 182.19.106.198 29.026ms 28.790ms 29.895ms
  5 103.29.44.7 28.610ms 29.569ms 28.049ms
  6 103.29.44.4 28.699ms 28.368ms 29.807ms
  7 72.14.211.218 40.036ms * 41.148ms
  8 108.170.248.161 34.918ms 35.271ms 33.666ms
  9 209.85.242.125 34.425ms 34.457ms 34.361ms
  10 216.239.34.117 36.580ms 35.929ms 36.776ms

  akansha@akansha-HP-Pavilion-Notebook:~$ traceroute facebook.com
  traceroute to facebook.com (31.13.79.35), 64 hops max
  1 172.21.68.3 1.226ms 1.211ms 1.187ms
  2 103.118.50.2 3.590ms 2.400ms 2.212ms
  3 118.185.199.190 8.359ms 7.454ms 8.026ms
  4 182.19.106.103 37.083ms 35.923ms 35.649ms
  5 103.4.99.20 34.336ms 32.912ms 32.498ms
  6 31.13.29.205 32.902ms 32.682ms 32.203ms
  7 157.240.36.141 33.137ms 33.247ms 32.198ms
  8 31.13.79.35 36.477ms 33.347ms 32.365ms

Section 2:

Q.no.3 :

The bandwidth of the medium has been calculated using ping command.
Average RTT taken for the packet of size 1000 bytes = 376.3 ms
Bandwidth = (1000*8)/((376.3/2)*10^(-3)) = 42.5 kbps