Q1) Build a topology consisting of two hosts and one switch(h1,h2,s1). To create the topology we need to make a class overriding the method 'build(self)'.

```
class TwoNodes(Topo):
    switch_s1 = None
    host_h1 = None
    host_h2 = None
def build(self):
```

- To add switches in the network use 'self.addSwitch("switch_name")'.
- To add hosts use 'self.addHost('host_name')'.
- To make a link between them use 'self.addLink(var1,var2)'

To make the topology instantiate the above class and pass it as a param of Mininet. I.e

```
topo = TwoNodes()
net = Mininet(topo = topo)
```

We can start the network using net.start(). We can also get a desired component using it's name by net.get(name)

- To get the ip of a host use host_name.IP()
- To run a command in the host use host_var_name.cmd('the_command')
- To start the server use iperf -s -p 5111 -i 2 > /tmp/server_log.txt &
  - Here -p represents the port number
  - To monitor the server at some time interval use -i time_interval
  - Use -s to start the server
- To start the client use iperf -c ' + server_ip+' -p 5111 -t 20 > /tmp/throughput.txt
  - To send packets for t time use -t time_interval
  - To start the the client use -c with the server_ip you want to listen

Q2) This uses all the commands as the previous one except for the following -
● To define the bandwidth of the link use bw= x (where x is in Mbps)
● To define the delay in the link use delay='xms'
● To define the packet drop % use loss = x (where x is percentage packet drop)
● To define the queue size at switch use max_queue_size=x (where x is some number)
● To ping all the hosts use net.pingAll()
● To dump the host connections use dumpNodeConnections(net.hosts).

Note - Use the following function to assign dpid to switches

```python
def int2dpid( self,dpid ):
    try:
        dpid = hex( dpid )[ 2: ] dpid = '0' * ( 16 - len( dpid ) ) + dpid
return dpid
    except IndexError:
        raise Exception( 'Unable to derive default datapath ID - ' 'please
either specify a dpid or use a ' 'canonical switch name such as s23.' )
```