Computer Networks

LAB#01 Task(1)

23K-2001
BCS-5J

```
C:\Users\memuz>hostname
Muzammil_Sidd

C:\Users\memuz>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2400:adc1:16f:a300::1
   IPv6 Address. . . . . . . . . . . : 2400:adc1:16f:a300:3e10:9181:8f8c:c0f
   Temporary IPv6 Address. . . . . . : 2400:adc1:16f:a300:2c52:4157:b12f:b2ea
   Link-local IPv6 Address . . . . . : fe80::ded9:f416:248d:2598%3
   IPv4 Address. . . . . . . . . . . : 192.168.18.197
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : fe80::1%3
                                       192.168.18.1

Wireless LAN adapter Wi-Fi:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

C:\Users\memuz>
```

Q2:

```
C:\Users\memuz>ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : Muzammil_Sidd
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GbE Family Controller
   Physical Address. . . . . . . . . : 30-24-A9-88-9C-A8
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv6 Address. . . . . . . . . . . : 2400:adc1:16f:a300::1(Preferred)
   Lease Obtained. . . . . . . . . . : Monday, September 1, 2025 10:47:48 PM
   Lease Expires . . . . . . . . . . : Tuesday, September 2, 2025 10:47:48 PM
   IPv6 Address. . . . . . . . . . . : 2400:adc1:16f:a300:3e10:9181:8f8c:c0f(Preferred)
   Temporary IPv6 Address. . . . . . : 2400:adc1:16f:a300:2c52:4157:b12f:b2ea(Preferred)
   Link-local IPv6 Address . . . . . : fe80::ded9:f416:248d:2598%3(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.18.197(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : Monday, September 1, 2025 10:47:49 PM
   Lease Expires . . . . . . . . . . : Tuesday, September 2, 2025 12:17:48 AM
   Default Gateway . . . . . . . . . : fe80::1%3
                                       192.168.18.1
   DHCP Server . . . . . . . . . . . : 192.168.18.1
   DHCPv6 IAID . . . . . . . . . . . : 70263977
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2E-CE-7B-A6-30-24-A9-88-9C-A8
   DNS Servers . . . . . . . . . . . : fe80::1%3
                                       192.168.18.1
                                       fe80::1%3
   NetBIOS over Tcpip. . . . . . . . : Enabled

Wireless LAN adapter Wi-Fi:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Intel(R) Wireless-AC 9560 160MHz
   Physical Address. . . . . . . . . : C8-E2-65-CB-D6-E4
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
   Physical Address. . . . . . . . . : C8-E2-65-CB-D6-E5
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
```

Q3:

```
Command Prompt                    ✕    +   ∨

C:\Users\memuz>hostname
Muzammil_Sidd

C:\Users\memuz>
```

Q4:

```
Command Prompt            ✕    +   ∨                                                                    ─

C:\Users\memuz>hostname
Muzammil_Sidd

C:\Users\memuz>netstat -an | find "80"
  TCP    0.0.0.0:7680           0.0.0.0:0              LISTENING
  TCP    127.0.0.1:58956        127.0.0.1:58980        ESTABLISHED
  TCP    127.0.0.1:58980        127.0.0.1:58956        ESTABLISHED
  TCP    [::]:7680              [::]:0                 LISTENING
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60406  [2a03:2880:f267:c5:face:b00c:0:7260]:5222  ESTABLISHED
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60634  [2a00:1450:4018:806::200a]:443  ESTABLISHED
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60636  [2a00:1450:4018:80f::200e]:443  ESTABLISHED
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60639  [2a00:1450:4018:806::200a]:443  ESTABLISHED
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60645  [2a00:1450:4018:806::200a]:443  ESTABLISHED
  UDP    [fe80::ded9:f416:248d:2598%3]:1900   *:*
  UDP    [fe80::ded9:f416:248d:2598%3]:50600   *:*

C:\Users\memuz>netstat -an | find "27"
  TCP    0.0.0.0:27036          0.0.0.0:0              LISTENING
  TCP    127.0.0.1:27060        0.0.0.0:0              LISTENING
  TCP    127.0.0.1:58954        0.0.0.0:0              LISTENING
  TCP    127.0.0.1:58956        0.0.0.0:0              LISTENING
  TCP    127.0.0.1:58956        127.0.0.1:58980        ESTABLISHED
  TCP    127.0.0.1:58958        0.0.0.0:0              LISTENING
  TCP    127.0.0.1:58958        127.0.0.1:58979        ESTABLISHED
  TCP    127.0.0.1:58979        127.0.0.1:58958        ESTABLISHED
  TCP    127.0.0.1:58980        127.0.0.1:58956        ESTABLISHED
  TCP    127.0.0.1:60019        127.0.0.1:60020        ESTABLISHED
  TCP    127.0.0.1:60020        127.0.0.1:60019        ESTABLISHED
  TCP    127.0.0.1:60021        127.0.0.1:60022        ESTABLISHED
  TCP    127.0.0.1:60022        127.0.0.1:60021        ESTABLISHED
  TCP    192.168.18.197:60070   185.25.183.36:27035    ESTABLISHED
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60617  [2606:4700:4400::6812:2715]:443  ESTABLISHED
  UDP    0.0.0.0:27036          *:*
  UDP    127.0.0.1:1900         *:*
  UDP    127.0.0.1:50603        *:*
  UDP    127.0.0.1:57481        127.0.0.1:57481
  UDP    192.168.18.197:27036   *:*

C:\Users\memuz>
```

```
Command Prompt                    ×    +  ∨

C:\Users\memuz>netstat -e
Interface Statistics

                          Received                Sent

Bytes                   2230756600          1207000236
Unicast packets            1264472             6380324
Non-unicast packets           6336               38932
Discards                       408                   0
Errors                           0                   0
Unknown protocols                0

C:\Users\memuz>
```

Q6:

```
Command Prompt                    ×    +    ∨

C:\Users\memuz>tracert www.github.com

Tracing route to github.com [20.207.73.82]
over a maximum of 30 hops:

  1     1 ms     6 ms     2 ms  192.168.18.1
  2     4 ms     5 ms     6 ms  202.163.100.245
  3     3 ms     2 ms     3 ms  192.168.230.33
  4     3 ms     2 ms     2 ms  192.168.94.73
  5     3 ms     3 ms     7 ms  192.168.4.29
  6    25 ms     5 ms     3 ms  192.168.67.106
  7     *         *       22 ms  192.168.62.18
  8    29 ms    25 ms    26 ms  msft-decix-02-dxb30.ntwk.msn.net [185.1.8.32]
  9    28 ms    26 ms    28 ms  ae23-0.icr01.dxb21.ntwk.msn.net [104.44.41.123]
 10    60 ms     *       61 ms  be-120-0.ibr02.dxb21.ntwk.msn.net [104.44.22.113]
 11     *       63 ms     *     51.10.19.120
 12    60 ms     *       61 ms  51.10.19.186
 13    60 ms    61 ms    60 ms  51.10.9.255
 14    60 ms    60 ms    60 ms  104.44.31.134
 15    61 ms    60 ms    60 ms  be-1-0.ibr02.pnq21.ntwk.msn.net [104.44.18.34]
 16    60 ms    60 ms    60 ms  ae122-0.rwa02.pnq21.ntwk.msn.net [104.44.11.254]
 17     *         *         *   Request timed out.
 18     *         *         *   Request timed out.
 19     *         *         *   Request timed out.
 20     *         *         *   Request timed out.
 21    60 ms    59 ms    60 ms  20.207.73.82

Trace complete.

C:\Users\memuz>
```

```
Command Prompt                    ×    +    ∨

C:\Users\memuz>tracert classroom.google.com

Tracing route to classroom.google.com [2a00:1450:4018:80f::200e]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  2400:adc1:0:6fa3:8c0a:919d:ced6:6881
  2     3 ms     5 ms     3 ms  2001:4538:a001:f008::2
  3     3 ms     2 ms     2 ms  2001:4538:a001:8::1
  4     4 ms     2 ms     2 ms  2001:4538:a001:d8::1
  5    28 ms    24 ms     3 ms  2001:4538:a001:c7::1
  6    20 ms    20 ms    20 ms  2001:4538:bb:3::2
  7     *         *         *   Request timed out.
  8    17 ms    17 ms    17 ms  2a00:1450:84c2::1
  9    20 ms    19 ms    19 ms  2001:4860:0:1::3988
 10    17 ms    17 ms    16 ms  2001:4860:0:1::7d99
 11    20 ms    19 ms    20 ms  lcmcta-ah-in-x0e.1e100.net [2a00:1450:4018:80f::200e]

Trace complete.
```

Q7:

There can be two reasons why a ping to the hostname fails: either the system cannot resolve the hostname to an IP address (DNS issue), or the machine name is not registered in the DNS file.

Q8:

Crossover Cable is used when the order of the wires on both ends of the RJ45 connector is different.

Q9:

Yes.

Q10:

Yes, but straight-through cable should be used instead as crossover cables are used for connecting similar devices.

Q11:

Yes.

```
C:\Users\memuz>arp -a

Interface: 192.168.18.197 --- 0x3
  Internet Address      Physical Address      Type
  192.168.18.1          44-a1-91-9a-33-76     dynamic
  192.168.18.255        ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

C:\Users\memuz>
```

```
Command Prompt                    ×    +   ∨                                          —    □

C:\Users\memuz>netstat -ano

Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    0.0.0.0:135            0.0.0.0:0              LISTENING       1508
  TCP    0.0.0.0:445            0.0.0.0:0              LISTENING       4
  TCP    0.0.0.0:5040           0.0.0.0:0              LISTENING       9828
  TCP    0.0.0.0:7680           0.0.0.0:0              LISTENING       5668
  TCP    0.0.0.0:27036          0.0.0.0:0              LISTENING       4936
  TCP    0.0.0.0:49664          0.0.0.0:0              LISTENING       1216
  TCP    0.0.0.0:49665          0.0.0.0:0              LISTENING       1044
  TCP    0.0.0.0:49666          0.0.0.0:0              LISTENING       1992
  TCP    0.0.0.0:49667          0.0.0.0:0              LISTENING       2748
  TCP    0.0.0.0:49669          0.0.0.0:0              LISTENING       5536
  TCP    0.0.0.0:49688          0.0.0.0:0              LISTENING       1168
  TCP    127.0.0.1:27060        0.0.0.0:0              LISTENING       4936
  TCP    127.0.0.1:58954        0.0.0.0:0              LISTENING       17340
  TCP    127.0.0.1:58956        0.0.0.0:0              LISTENING       4936
  TCP    127.0.0.1:58956        127.0.0.1:58980        ESTABLISHED     4936
  TCP    127.0.0.1:58958        0.0.0.0:0              LISTENING       4936
  TCP    127.0.0.1:58958        127.0.0.1:58979        ESTABLISHED     4936
  TCP    127.0.0.1:58979        127.0.0.1:58958        ESTABLISHED     9936
  TCP    127.0.0.1:58980        127.0.0.1:58956        ESTABLISHED     9936
  TCP    127.0.0.1:60019        127.0.0.1:60020        ESTABLISHED     10312
  TCP    127.0.0.1:60020        127.0.0.1:60019        ESTABLISHED     10312
  TCP    127.0.0.1:60021        127.0.0.1:60022        ESTABLISHED     14848
  TCP    127.0.0.1:60022        127.0.0.1:60021        ESTABLISHED     14848
  TCP    192.168.18.197:139     0.0.0.0:0              LISTENING       4
  TCP    192.168.18.197:60067   54.166.110.74:443      ESTABLISHED     2992
  TCP    192.168.18.197:60070   185.25.183.36:27035    ESTABLISHED     4936
  TCP    192.168.18.197:60832   140.82.114.26:443      ESTABLISHED     10312
  TCP    192.168.18.197:60876   34.107.243.93:443      ESTABLISHED     10312
  TCP    192.168.18.197:60886   34.120.208.123:443     ESTABLISHED     10312
  TCP    192.168.18.197:60916   3.229.29.197:443       CLOSE_WAIT      2992
  TCP    192.168.18.197:60917   52.2.244.83:443        CLOSE_WAIT      2992
  TCP    192.168.18.197:60925   142.250.202.194:443    TIME_WAIT       0
  TCP    192.168.18.197:60940   142.250.202.226:443    ESTABLISHED     10312
  TCP    [::]:135               [::]:0                 LISTENING       1508
  TCP    [::]:445               [::]:0                 LISTENING       4
  TCP    [::]:7680              [::]:0                 LISTENING       5668
  TCP    [::]:49664             [::]:0                 LISTENING       1216
  TCP    [::]:49665             [::]:0                 LISTENING       1044
  TCP    [::]:49666             [::]:0                 LISTENING       1992
  TCP    [::]:49667             [::]:0                 LISTENING       2748
  TCP    [::]:49669             [::]:0                 LISTENING       5536
  TCP    [::]:49688             [::]:0                 LISTENING       1168
  TCP    [::1]:42050            [::]:0                 LISTENING       1080
  TCP    [::1]:49670            [::]:0                 LISTENING       6040
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60016  [2603:1040:a06:6::]:443  ESTABLISHED     6340
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60018  [2603:1040:a06:6::]:443  ESTABLISHED     6204
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60406  [2a03:2880:f267:c5:face:b00c:0:7260]:5222  TIME_WAIT       0
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60617  [2606:4700:4400::6812:2715]:443  ESTABLISHED     10312
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60623  [2a00:1450:4018:811::2003]:443  ESTABLISHED     10312
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60853  [2a00:1450:4018:80d::200a]:443  TIME_WAIT       0
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60906  [2a00:1450:4018:812::2002]:443  TIME_WAIT       0
  TCP    [2400:adc1:16f:a300:2c52:4157:b12f:b2ea]:60909  [2a00:1450:4018:80f::200e]:443  TIME_WAIT       0
```

Q14:

```
Command Prompt                    ×    +    ⌄

C:\Users\memuz>nslookup 224.0.0.22
Server:   Unknown
Address:  fe80::1

Name:     igmp.mcast.net
Address:  224.0.0.22


C:\Users\memuz>ping igmp.mcast.net

Pinging igmp.mcast.net [224.0.0.22] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 224.0.0.22:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\memuz>ping localhost

Pinging Muzammil_Sidd [::1] with 32 bytes of data:
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms

Ping statistics for ::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\memuz>
```

There are multiple reasons for no connectivity such as:

Wrong IP or hostname. - The host is offline. - Firewall blocking ICMP. - Network cable damaged or misconfigured.

Ans1: Address Class Identification

1. A
2. B
3. B
4. C
5. C
6. A
7. A
8. A
9. A
10. C

Ans2: Host & Network Identification

Circle the network portion of these addresses:

(177.100.)18.4

(119.)18.45.0

209.240.80.78

199.155.77.56

117.89.56.45

215.45.45.0

192.200.15.0

95.0.21.90

33.0.0.0

158.98.80.0

217.21.56.0

10.250.1.1

150.10.15.0

192.14.2.0

148.17.9.1

193.42.1.1

126.8.156.0

220.200.23.1

Circle the host portion of these addresses:

10.(15.123.50)

171.2.(199.31)

198.125.87.**177**

223.250.200.**222**

17.**45.222.45**

126.**201.54.231**

191.41.**35.112**

155.25.**169.227**

192.15.155.**2**

123.**102.45.254**

148.17.**9.155**

100.**25.1.1**

195.0.21.**98**

25.**250.135.46**

171.102.**77.77**

55.**250.5.5**

218.155.230.**14**

10.**250.1.1**

Ans3: Network Addresses

3. 192.149.24.0
4. 150.203.0.0
5. 10.0.0.0
6. 186.13.23.0
7. 223.69.0.0
8. 200.120.135.0

Ans4: Host Addresses

3. 0.0.0.11
4. 0.0.230.19
5. 0.10.10.10
6. 0.0.0.11
7. 0.0.23.20
8. 0.0.0.215

Ans5: Default Subnet Masks

1. 255.0.0.0
2. 255.0.0.0
3. 255.255.0.0

4. 255.255.0.0
5. 255.255.255.0
6. 255.0.0.0
7. 255.0.0.0
8. 255.255.0.0
9. 255.255.0.0
10. 255.255.255.0
11. 255.255.255.0