

Name:

Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Semester Examination, December 2021**

**Course Name : Data Communication and Networking**

**Semester: V**

**Program Name : B. Tech ECE**

**Time : 03 hrs**

**Course Code : ECEG 3004**

**Max. Marks : 100**

**No of page : 03**

Instructions:

- 1) *Attempt and answer all Questions in serial manner*
- 2) *Answer must be in brief and diagrams must be clear.*

**SECTION A**

**Each Question will carry 4 Marks**

**Instruction: Complete the statement / Select the correct answer(s)**

S. No.	Question	CO
Q 1	The encapsulation task of each layer of Internet model are .....(application layer), .....(transport layer), .....(network layer), .....(datalink layer), .....(physical layer) respectively.	CO1
Q 2	Amongst the following (IPv6, MAC, UDP, NAT, CATV, FTTH, FTP, HTTP, VoIP, coaxial, LAN, NAT,), the protocol assigned in the five layers of TCP/IP model are.....(application layer), .....(transport layer), .....(network layer), .....(datalink layer), .....(physical layer) respectively.	CO1
Q 3	State the Class of the following IPv4 addresses. (a) 192.56.45.78 (b) 228.34.7.8.20 (c) 192.68.256.14 (d) 172.45.30.14 (e) 56. 23.14.67	CO2
Q 4	State the name and one purpose of at least five application layer protocol.	CO2
Q 5	Which mode of communication (full duplex/ simplex/ half duplex) is required in the following cases? (a) Requesting a webpage from server. (b) Sending a mail (c) TV transmission (d) Telephone line (e) Data link's flow control	CO1

**SECTION B**

**Each question will carry 10 marks**

**Instruction: Write short / brief notes**

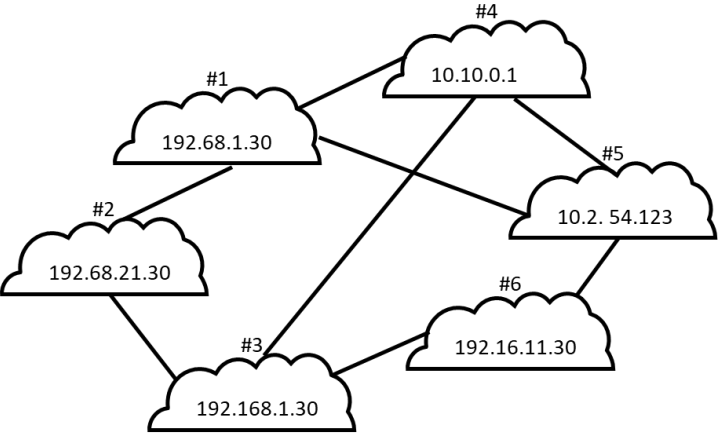
Q 1	Discuss the function of <b>DNS</b> with the clear diagram.	<b>CO3</b>
Q 2	Sketch the Go <b>Back-N</b> ARQ flow control and <b>ENQ/ ACK</b> flow control of data link layer	<b>CO3</b>
Q 3	Why <b>optical fiber, coaxial cable and twisted pair</b> cable finds their exclusive application in WAN, CATV and LAN respectively.	<b>CO2</b>
Q 4	Compare the two widely used <b>protocol</b> of <b>transport layer</b> .	<b>CO2</b>

**SECTION C**

**Each Question carries 20 Marks.**

**Instruction: Write long answer.**

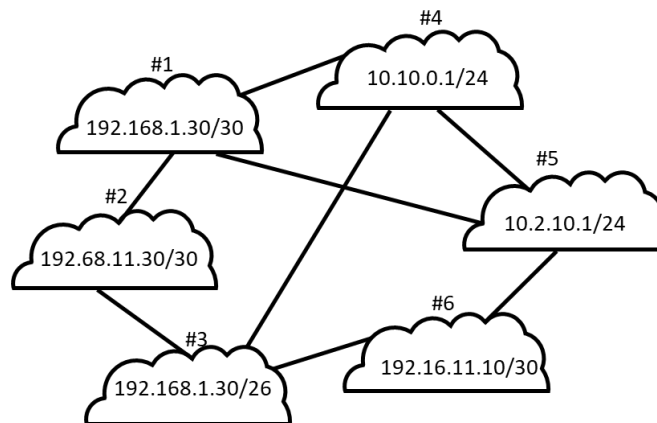
Q 1	<p>An engineer has been assigned an IP address <b>192.68.118.40/ 28</b> to give the links to the nodes in the designing of an intra network system.</p> <p>(a) Determine the <b>class</b> of IP.</p> <p>(b) Convert into <b>Binary</b> form with proper step.</p> <p>(c) Convert into <b>Hexadecimal</b> form with proper step.</p> <p>(d) Find the <b>Default subnet mask</b></p> <p>(e) Find the <b>subnet mask</b> used for sub-netting.</p> <p>(f) Find the <b>number of networks</b> that can be created using this IP.</p> <p>(g) Find the <b>number of hosts</b> that can be assigned this IP.</p> <p>(h) Find the <b>Gateway ID</b>.</p> <p>(i) Write the <b>action</b> of the protocol that map physical and logical address here.</p> <p>(j) Type of <b>router</b> to get link for the access.</p>	<b>CO3</b>
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Q 2	<p>(a) Consider this an inter-connection of <b>six network</b> numbering from #1 to #6.</p>  <p>The diagram shows six networks represented by cloud shapes, each with an IP address and a label (#1 to #6):</p> <ul style="list-style-type: none"> <li>#1: 192.68.1.30</li> <li>#2: 192.68.21.30</li> <li>#3: 192.168.1.30</li> <li>#4: 10.10.0.1</li> <li>#5: 10.2. 54.123</li> <li>#6: 192.16.11.30</li> </ul> <p>Connections between networks are shown as lines:</p> <ul style="list-style-type: none"> <li>#1 is connected to #2, #3, and #4.</li> <li>#2 is connected to #1 and #3.</li> <li>#3 is connected to #1, #2, #4, and #6.</li> <li>#4 is connected to #1, #3, and #5.</li> <li>#5 is connected to #4 and #6.</li> <li>#6 is connected to #3 and #5.</li> </ul>	<b>CO4</b>
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Find the **optimum path** in **routing** of each of these packets from the correct source network to the correct destination network, between the following pair of source and destination IP given below. If **no path** is available, do mention it also.

Case No	Source	Destination
1	192.168.1.73	10.2.100.1
2	192.68.1.30	10.10.0.1
3	10.10.1.32	192.16.11.1
4	192.168.1.1	10.1.1.1
5	192.16.11.100	192.168.2.30

(b) If subnetting has been done, then the above figure is updated as below.



Now find the optimum path in routing. If there is **no path** do mention it also

Case No	Source	Destination
1	192.168.1.73	192.68.11.30
2	192.68.1.30	10.10.0.1
3	10.10.1.32	192.16.11.1
4	10.2.101.250	10.1.1.1
5	192.16.11.100	192.168.2.30

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