B.SC. (I. T.) SEM. - III (CBCS - 2015 COURSE) : SUMMER - 2018

SUBJECT: DATA NETWORKS

Day: **Thursday** Time: **02.30 p.m. to 05.30 p.m.**

Date: **17/05/2018** Max. Marks: 60

S-2018-0949

N.B.:

1) Attempt **ANY FIVE** full questions.
2) Make any assumptions required, stating the assumptions made.
3) Draw neat, labeled diagrams **WHERE** necessary.
4) Figures to the right indicate **FULL** marks.

Q.1 **a)** Explain the role of each layer in the TCP/IP model. **(05)**

b) What is the function of a Router in a network? Is there a need for the transport layer in a Router? Explain your answer. **(07)**

Q.2 **a)** What is framing? Describe how framing is carried out in the HDLC protocol. **(06)**

b) In a Stop-and–Wait ARQ system, line bandwidth is 1 Mbps. One bit takes 20 ms to make a round trip. If data frames are 1000 bits in length, calculate the utilization percentage of the link. **(06)**

Q.3 **a)** Briefly explain how each of the functions of the data link layer are carried out in Ethernet. **(04)**

b) Compare the roles of the LLC, MAC and PHY layers in an 802 based WLAN. **(08)**

Q.4 **a)** What is classless addressing in IPv4? List the restrictions (rules) for an allocation of classless IPv4 addresses. **(04)**

b) An organization is given the block 17.12.40.0/26. The address space is to be divided among three offices needing 32, 16 and 16 addresses. Determine an appropriate address allocation. **(08)**

Q.5 **a)** Compare and contrast TCP and UDP. Give an application for each. **(06)**

b) Explain the three-way handshake mechanism for TCP. **(06)**

Q.6 **a)** What is congestion control in a network? Briefly explain how TCP carries out congestion control. **(08)**

b) Explain why a mail server has two different protocols- one for sending and another for retrieving e-mails. **(04)**

Q.7 Write short notes on (**ANY TWO**) of the following: **(12)**

a) IPv6
b) Traffic Shaping
c) OSPF
d) VLAN

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