

**MORNING**

**06 JAN 2023**

[Total No. of Questions: 09]

[Total No. of Pages:02.]

Uni. Roll No. ....

Program: B.Tech. (Batch 2018 onward)

Semester: 3

Name of Subject: Data Communication and Computer Networks

Subject Code: PCIT-103

Paper ID: 16043

Scientific calculator is Allowed

**Time Allowed: 03 Hours**

**Max. Marks: 60**

**NOTE:**

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

**Part – A**

**[Marks: 02 each]**

1. a) Differentiate between TCP and UDP model
- b) State the purpose of DNS and its main functions.
- c) Define Flow control and Error control
- d) If a periodic signal is decomposed into five sine waves with frequencies of 200,400, 600, 800, and 1000 Hz, what is its bandwidth? Draw the spectrum, assuming all components have a maximum amplitude of 10 V.
- e) Calculate the checksum for the following packets: 10110 11010 10001.
- f) We have a channel with a 1-MHz bandwidth. The SNR for this channel is 63. What is the appropriate bit rate and signal level?

**Part – B**

**[Marks: 04 each]**

2. Explain framing and different framing algorithms?
3. Write a short note on a) Leaky bucket algorithms. b) Token bucket algorithms
4. Compare and contrast IPv4 and IPv6.
5. What is the maximum capacity of a medium with a bandwidth of 750KHz and a signal-to-noise ratio of 30dB?
6. Explain the Shielded twisted pair (STP) and Unshielded twisted pair(UTP)

7. Calculate a) network address b) host address c) number of networks d) number of hosts  
e) subnet mask for

i) 102.45.09.5

ii) 197.64.3.8

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**Part – C**

**[Marks: 12 each]**

8. With a neat diagram explain the OSI reference model in detail? Explain the functions performed in each layer.

OR

What is classfull addressing? Discuss class A, class B, class C, class D, class E address with its range in decimal dotted notation and example.

9. Explain the CSMA protocols in detail.

OR

Evaluate the distance vector routing algorithm using suitable examples

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