**20CS3503/201T3503 -COMPUTER NETWORKS**

**Offering Branches**

CSE, IT

**Course**

Professional core

**Category:**

**Course Type:** Theory

**Prerequisites:** Data Structures, Operating Systems

**Course Outcomes**

PVP20

**Credits**:

3

**Lecture-Tutorial-**

3-0-0

**Practical:**

**Continuous**

**30**

**Evaluation:**

**Semester End**

70

**Evaluation:**

**Total Marks**:

100

**CO2**

Upon successful completion of the course, the student will be able to:

**CO1**

Understand the basic concepts and protocols of different **layers**. Apply Error Correction **or** MAC Protocol mechanism for **a** given scenario.

L2

L3

**CO3**

Apply various Addressing mechanisms /Routing protocols for a given network.

L3

**CO4**

Apply appropriate Transport & Application layer protocol for a given

L3

context.

**CO5**

L4

**UNIT-1**

**UNIT-2**

**UNIT-3**

Analyze the given scenario and use appropriate methods/mechanisms/protocols for designing a network.

**Course Content**

**Introduction** :-Networks, Network Types, Network Models :-The Protocol Layering, TCP/**IP** Protocol Suite, The OSI Model, **Physical Layer** :-Transmission Media Guided Media, Un-Guided Media

**Data-Link Layer:** Introduction to Data-Link Layer Introduction, Link-Layer Addressing. Error Detection and Correction - Introduction, Cyclic Redundancy Check. Data Link Control (DLC) - DLC Services. Media Access Control (MAC) - Random Access, Controlled Access. **Network Layer**: Introduction to Network Layer - Network-Layer Services, Packet Switching, Network-Layer Performance, IPv4 Addresses

**Next Generation IP-** IPv6 Addressing, The IPv6 Protocol

**CO1,CO2**

**CO1,CO2,CO5**

**Network-Layer Protocols -** Internet Protocol (IP), Unicast Routing - Introduction, Routing Algorithms- Distance vector and Link State Routing, Unicast Routing Protocols.

**CO1**,**CO2,CO4**,

**CO5**

**UNIT**-4

**UNIT-5**

**Transport Layer:** Introduction to Transport Layer-Introduction, Transport-Layer Protocols. Transport Layer Protocols-Introduction, **CO1,CO3,CO5** User Datagram Protocol(UDP), Transmission Control Protocol(TCP) **Application Layer:** Standard Client-Server Protocols-World Wide

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**CO1.CO3**

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**20CS3503/201T3503 -COMPUTER NETWORKS**

**Offering Branches**

CSE, IT

**Course**

Professional core

**Category:**

**Course Type:** Theory

**MICRO SYLLABUS**

**Prerequisites:** Data Structures, Operating Systems

PVP20

**Credits:**

3

**Lecture-Tutorial-**

3-0-0

**Practical:**

**Continuous**

30

**Evaluation:**

**Semester End**

70

**Evaluation**:

**Total Marks:**

100

**CO2**

**Course Outcomes** Upon successful completion of the course, the student will be able to:

**CO1**

Understand the basic concepts and protocols of different layers. Apply Error Correction or MAC Protocol mechanism for a given scenario.

L2

L3

**CO3**

Apply various Addressing mechanisms /Routing protocols for a given network.

L3

Apply appropriate Transport **&** Application layer protocol for a given

**CO4**

L3

context.

Analyze the given scenario and use appropriate

**CO5**

L4

methods/mechanisms/protocols for designing a network.

**Course Content**

**Prescribed Text Book: Data Communications and Networking, Behrouz A. Forouzan, Fifth Edition**,

**Introduction: [Chapter 1 (1.1-1.3)]**

**McGraw Hill**

DATA COMMUNICATIONS: Components, Data Representation, Data Flow

NETWORKS: Network Criteria, Physical Structures

NETWORK TYPES: Local Area Network, Wide Area Network, Switching, The

Internet, Accessing the Internet

**UNIT-1**

**Network Models: [Chapter 2]**

PROTOCOL LAYERING: Scenarios, Principles of Protocol Layering, Logical Connections

TCP/IP PROTOCOL SUITE: Layered Architecture, Layers in the TCP**/**IP Protocol Suite, Description of Each Layer, Encapsulation and Decapsulation, Addressing, Multiplexing and Demultiplexing

THE OSI MODEL: OSI versus TCP/IP**,** Lack of OSI Model's Success **Physical Layer-Transmission Media [Chapter 7]**

INTRODUCTION

GUIDED MEDIA: Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable UNGUIDED MEDIA: WIRELESS: Radio Waves, Microwaves, Infrared **Data-Link Layer: Introduction** to **Data-Link Layer [Chapter 9]** INTRODUCTION: Nodes and Links, Services, Two Categories of Links, Two

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**CO1,CO2**

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**Text Books**

**Reference**

**Books**

TELNET: Local versus Remote Logging

SECURE SHELL (SSH): Components, Applications,

DOMAIN NAME SYSTEM (DNS): Name Space, DNS in the Internet, Resolution, Caching, Resource Records, DNS Messages, Registrars, DDNS, Security of DNS

**Learning Resources**

1.Data Communications and Networking, Behrouz A. Forouzan, Fifth Edition, McGraw Hill

1. Computer Networking A Top-Down Approach, James F. Kurose, Keith W. Ross, Sixth Edition, Pearson Education

2. Computer Networks - A Systems Approach, Larry L. Peterson, Bruce S. Davie, Fifth Edition, Morgan Kaufmann.

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Code No: **20CS3503/201T3503**

**PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY**

**Duration: 3 Hours**

**(Autonomous)**

**COMPUTER NETWORKS**

**(Common to CSE**, **IT)**

Max**. Marks: 70**

Note: 1. This question paper contains 5 essay questions with an internal choice.

2. Each question carries 14 marks and may have sub questions. 3. All parts of Question paper must be answered in one place

**PVP20**

5 x 1470 Marks

Blooms Level

Max.

CO

Marks

**UNIT-I**

(a)

**Illustrate** the differences and commonalities between the TCP/IP and OSI models.

L2

CO1

7

1

(b)

**Apply** G = 1⁄2, G-1 for Slotted ALOHA and find out the effect of it on throughput

L3

CO2

7

**OR**

2

**Make use of** Cyclic Redundancy Check mechanism for the following data: (a) Code word: 1001, Divisor: 1011 and check whether frame is transmitted

successfully or not.

DLL at a device has 3 one byte frames sent as a data stream by the physical layer; state any one mechanism that the DLL adapt at the senders end so (b) that the receiving end can identify the frames from the received stream of data from physical layer. **Illustrate** the above scenario with a suitable example.

L2

CO2

7

L3

CO2

7

**UNIT-II**

(a)

**Illustrate** how Packet Switching is used as a connectionless service with an example showing the forwarding/routing tables at each and every router. The CIDR notation of a IP address **is** as follows:

L2

CO3

7

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**3**

i) What type of address is the above(Host/network/broadcast**)**?

ii) What is the network address?

(b)

L3

CO3

7

iii) What are the total numbers of hosts that can be connected in that network?

iv) What is the subnet mask?

(a)

v) What is the broadcast address of that network?

**OR**

In the Figure, assume that the link between R1 and R2 is upgraded to 170 kbps and the link between the source host and R1 is now downgraded to 140 kbps. What is the throughput between the source and destination after these changes? Which link is the bottleneck now?

TR: 200 kbps

TR: 100 kbps

TR: 150 kbps

Link!

Link2

Link3

Source

R1

R2

Destination

# BONEY

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L2

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**OR**

(**a**) **Illustrate** Electronic Mail Architecture in detail.

10

(b)

**Show** your understanding about components of Secure Shell (SSH) for various Applications.

L2

CO4

7

L3

CO4

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CSE:

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