Paper Code: ARM 205	**L**	**T/P**	**Credits**
Subject: Computer Networks	3	-	3

Marking Scheme

1. Teachers Continuous Evaluation: 25 Marks
2. End Term Theory Examination: 75 Marks

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 75**

1. There should be 9 questions in the end term examination question paper
2. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 15 marks.
3. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.
4. The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/ level of the questions to be asked should be at the level of the prescribed textbooks.
5. The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required

Course Outcomes:

CO1:	Ability of students to design machine components, mechanisms, predict failure and understand the physical properties of materials.
CO2:	Ability of students to implement fundamentals of basic tools for stress, strain and deformation analysis and determine the stresses, strains and deformations produced by applied loads.
CO3:	Ability of students to analyze and design components and structural members subjected to tension, compression, torsion, bending and combined loads using fundamental concepts of stress, strain, elastic and inelastic behavior
CO4:	Ability of students to be able to conduct themselves in a professional manner and with regard to their responsibilities to society; especially with regard to design of mechanisms and prevention of failure

Course Outcomes (CO) to Programme Outcomes (PO) Mapping (Scale 1: Low, 2: Medium, 3: High

CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	3	3	3	3	1	-	-	-	-	-	1	2
CO2	3	3	3	3	1	-	-	-	-	-	1	2
CO3	3	3	3	3	1	-	-	-	-	-	2	3
CO4	3	3	3	3	1	-	-	-	-	-	2	3

Unit I **[14]**

Introduction: Introduction: Internet History, Uses of computer networks, Network hardware, network software, Protocol layering, Reference models (OSI & TThis course will teach the basics of computer network and distributed big data storage and retrieval. Last Unit focuses on the use of cloud infrastructures and highlights its benefits to overcome the identified issues and to provide new approaches for managing huge volumes of heterogeneous data.
CP/IP), Network standardization.

The Physical Layer: Theoretical basis for data communication, Transmission media: Guided and Unguided media, Switching (circuit, packet), Multiplexing (FDM, WDM, and TDM), Overview of PSTN, ISDN, and ATM.

Unit II **[10]**

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The Data Link Layer: Data link layer design issues, Error detection and Correction Techniques, Elementary data link control protocols, Sliding window protocols, Example data link protocols (HDLC and PPP). The Medium Access Sublayer: The channel allocation problem, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLANs, Network devices-repeaters, hubs, Bridge, Switches and Routers

Transmission Networks: PDH Networks, SONET/SDH Networks, DWDM Networks, Introduction to Cell Switched Networks e.g Asynchronous Transfer Mode (ATM) and Packet Switched Networks

Unit III **[10]**

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithms, Quality of Service, Introduction to IPv4 Addressing, Subnetworks and Subnetting, IPv4 protocol Packet Format, Forwarding of IP packets, IPv4 vs IPv6, Congestion control algorithms. Delay Models in Data Networks: Queueing Models, M/M/1 Queueing System, M/M/m/m and Markov Systems.

Transport layer: Transport layer services, Elements of transport protocols, Overview of UDP and TCP

Unit IV **[10]**

Networking for Big Data: Networking Theory and Design for Big Data (Networking Server for computation, Introduction to Traffic engineering inside a data center, data center as a collection of storage servers) Networking Security for big data.

Text Books:

1. Dimitri, B., & Robert, G. (2000). *Data networks*.
2. Stojcev, M. (2005). *Data Communications and Networking*, Behrouz A. Forouzan, McGraw-Hill Higher Education, Boston (2003), Softcover, pp. 973, plus XXXIV, ISBN: 0-07-251584-8.
3. Yu, S., Lin, X., Misic, J., & Shen, X. S. (Eds.). (2015). *Networking for big data* (Vol. 2). CRC Press.

Reference Books:

1. Black, U. (1993). *Computer networks protocols, standards, and interfaces*. Prentice-Hall, Inc.
2. A. Tannenbaum. (2011) *Computer Networks*, 5th edition, Pearson.

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