Paper code : ARD 212	L	T/P	Credits
Subject : Computer Networks	3	0	3

Marking Scheme:
Teachers Continuous Evaluation: As per university examination norms from time to time.
End Term Theory Examination: As per university examination norms from time to time.

INSTRUCTIONS TO PAPER SETTERS: Maximum Marks : AS per University norms
➢ There should be 9 questions in the end term examination question paper
➢ Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions.
➢ Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit.
➢ 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.
➢ The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required

Course Outcomes [Bloom's Knowledge Level (KL)]:

CO1: To **Understand** the basic concepts of Computer Network. **[K2]**

CO2: To **Understand and remember** layers of OSI Model, Multiplexing and Transmission Media **[K1, K2]**

CO3: To **Analyze** the different Routing Techniques and IP Addressing Schemes. **[K4]**

CO4: To **Apply** the concept of the Routing Techniques learned to **Create** (design and develop a new routing technique). **[K3, K6]**

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	2	-	-	-	-	1	2
CO3	3	3	3	3	1	2	-	-	-	1	2	3
CO4	3	3	3	3	1	2	-	-	-	2	2	3

Course Content	**No of Lectures**
Unit I **Introduction: Introduction:** Internet History, Uses of computer networks, Network hardware, network software, Protocol layering, Reference models (OSI & TCP/IP Model). **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.	**[10]**

Unit II **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	**[10]**
Unit III **Transport layer:** Transport layer services, Elements of transport protocols, Overview of UDP and TCP. Networking Theory and Design for Big Data (Networking Server for computation **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.	**[8]**
Unit IV **Case Study :** Design and Development of new Routing Technique for determination of the optimized routing path in Wireline Network	**[8]**
Text Books: [T1] Behrouz A. Forouzan, McGraw-Hill Higher Education, Boston (2003), Softcover, pp. 973, plus XXXIV, ISBN: 0-07-251584-8. [T2] Yu, S., Lin, X., Misic, J., & Shen, X. S. (Eds.). (2015). Networking for big data (Vol. 2). CRC Press. [T3] Dimitri, B., & Robert, G. (2000). Data networks.	
Reference Books: [R1] Black, U. (1993). Computer networks protocols, standards, and interfaces. Prentice-Hall, Inc.. [R2] A. Tanenbaum (2011) Computer Networks. 5th edition, Pearson	