NEXT GENERATION NETWORKS

Paper Code: ETIT-420	**L**	**T/P**	**C**
Paper: Next Generation Networks	**3**	**0**	**3**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. 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 25 marks.
2. 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 of 12.5 marks.

Objectives: The objective of this paper is to introduce the students about the advanced and next generation networks and wireless access and transportation technologies.

UNIT I

Converged Services for Next Generation Networks

GSM/UMTS Network protocols: SS7 and 1tandardi basics, Supplementary Services: UMTS procedures. Intelligent Network: IN principles, CAMEL, Services: what are the challenges? , Integration, deployment issues. Next Generation Networks: IMS: the convergence. NGN architecture, NGN control architectures and protocols, Multi-access to the services: 3G, WiFi, DSL, Cable. TISPAN, SIP, Service architectures, Transition of networks (PSTN, IP-based) to NGN, Ipv6-based NGN, MEGACO, H.248, P2P systems, P2P SIP, Social Networks: Web-NGN convergence, Telco 2.0, IPTV, RCS. UMTS 1tandardized1on at 3GPP: Standardisation process and principles in ETSI and 3GPP, Functionalities 1tandardized in UMTS from Release 99 to Release 9. Latest 3GPP updates: what happened in 2010?

[T1, T2][No. of Hrs. 12]

UNIT II

Wireless Access and Transport Technologies

RAN architecture : Radio Access Network Architecture for GSM, GPRS and UMTS, network devices, interfaces and protocols , QoS definition and management in GPRS and UMTS, Access methods and radio resource management in mobile networks, mainly for: TDMA systems, CDMA systems and OFDMA systems. Scheduling issues for GPRS, UMTS and WiMAX : downlink, uplink Physical to logical channel mapping : for GSM , for UMTS Procedure and protocol used for resource allocation ,PDP Context and TBF allocation.

[T1][No. of Hrs. 12]

UNIT III

WPAN, WLAN, WMAN and Broadcast technologies

WLAN, WPAN, WMAN, DVB-H: Introduction ,WiFi: Standards, performance, usage and applications, new evolutions ,WiMAX, DVB-H :Usage and standard, Security :Basics, architectures, algorithms, Bluetooth: Standard, performance, usage and applications , Zigbee, UWB: Standards and usage, Service discovery in wireless Networks (jxta, UPnP,…) , Security in Wireless Networks: PANs, LANs and cellular Wireless Networks Simulation (tools and methods)

[T1][No. of Hrs. 10]

UNIT IV

Optimization: Theory and Network applications

Graph algorithms, linear programming basics, Introduction to Integer programming, Traffic engineering, Network topology calculus, Network optimal routing and dimensioning, Frequency assignment, Pricing, Game theory.

[T2][No. of Hrs. 10]

Text Books:

[T1] Next Generation Network Services: Technologies & Strategies by Neill Wilkinson, Publication, 2002 ISBN-10: 0471486671 | ISBN-13: 978-0471486671 | Edition: 1.

[T2] Next Generation Networks: Perspectives and Potentials by Jingming Li Salina, Pascal Salina, Publisher:John Wiley & Sons, 2008, ISBN:0470724471, 9780470724477.

Reference book:

[R1] Next-Generation Network Services: By Robert Wood, Published Nov 1, 2005 by Cisco Press. Part of the Networking Technology series

[R2] Best Practices for Implementing Next Generation Networks (NGN) in the Asia and Pacific Region, International Telecommunication Union, Telecommunication Development Bureau, June 2012.