ACADEMIC LESSON PLAN FOR WINTER -2023

Dept. of Electronics & Telecommunication, RKCAT Polytechnic,

BalasoreName of the Faculty: ER.PRIYA RANJAN SEN

WAVE PROPAGATION &BROADBAND COMMUNICATION ENGINEERING

(TH-4)

Theory : 4 P/W Internal Assessment : 20 Marks

Total Period s : 60 P/ Sem End Semester Exam : 80marks

Examination : 3 Hours TOTAL MARKS : 100 Marks

SEM : 5 E&TC Start of Class : 01

PERIOD	TOPIC COVERED	DATE	REMARKS
UNIT-01 TOTAL PERIOD-12 **WAVE PROPAGATION & ANTENNA** 1ST	Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only)		
2ND	impedance,efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern		
3RD	Classification based on Modes of Propagation-Ground wave, Ionosphere ,Sky wave propagation, Spacewave propagation		
4TH	Definition – critical frequency, max. useable frequency, skip distance, fading,		
5TH	Duct propagation &Troposphere scatter propagation actual height and virtual height Radiation mechanism of an antenna-Maxwell equation		
6TH	Definition - Antenna gains, Directive gain,		
7TH	Directivity, effective aperture, polarization, input		
8TH	Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna		
9TH	Operation of following antenna with advantage & applications.		
10TH	Directional high frequency antenna : , Yagi & Rohmbus only		

11TH	UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna		
12TH	Basic Concepts of Smart Antennas- Concept and benefits of smart antennas		
UNIT-2 **TRANSMISSION LINES** **1st**	Fundamentals of transmission line.		
2ND	Equivalent circuit of transmission line & RF equivalent circuit		
3RD	Characteristics impedance, methods of calculations & simple numerical		
4TH	Characteristics impedance, methods of calculations & simple numerical.		
5TH	Losses in transmission line.		
6TH	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical		
7TH	Problem practice		
8TH	Quarter wave & half wavelength line		
9TH	Impedance matching & Stubs – single & double		
10TH	Primary & secondary constant of X-mission line		
Unit-03 **TELEVISION ENGINEERING** 1ST	Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlacedscanning, Composite video signal, Synchronization pulses		
2ND	TV Transmitter – Block diagram & function of each block.		
3RD	Monochrome TV Receiver -Block diagram & function of each block		
4TH	Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).		
5TH	Types of Televisions by Technology- cathode-ray tube TVs,		
6TH	Plasma Display Panels, Digital Light Processing (DLP),Liquid Crystal Display		

	(LCD),Organic Light-Emitting Diode (OLED)		
7TH	Liquid Crystal Display (LCD),Organic Light-Emitting Diode (OLED)		
8TH	Display, QuantumLight-Emitting Diode (QLED) – **only Comparison based on application**		
9TH	Discuss the principle of operation - LCD display, Large Screen Display.		
10TH	CATV systems & Types & networks		
11TH	Digital TV Technology-Digital TV Signals,		
12TH	Transmission of digital TV signals & Digital TV receiver Videoprogramme processor unit.		
13TH	Transmission of digital TV signals & Digital TV receiver Videoprogramme processor unit.		
Unit-4: MICROWAVE ENGINEERING. 1ST	Define Microwave Wave Guides		
2ND	Operation of rectangular wave gives and its advantage.		
3RD	Propagation of EM wave through wave guide with TE & TM modes		
4TH	Circular wave guide		
5TH	Operational Cavity resonator		
6TH	Working of Directional coupler, Isolators & Circulator		
7TH	Working of Directional coupler, Isolators & Circulator		
8TH	Working of Directional coupler, Isolators & Circulator		
9TH	Working of Directional coupler, Isolators & Circulator		
10TH	Microwave tubes-Principle of operational of two Cavity Klystron.		

11TH	Microwave tubes-Principle of operational of two Cavity Klystron.		
12TH	Microwave tubes-Principle of operational of two Cavity Klystron.		
13TH	Principle of Operations of Travelling Wave Tubes		
14TH	Principle of Operations of Cyclotron		
15TH	Principle of Operations of Tunnel Diode & Gunn diode		
Unit-5: Broadband communication 1ST	Broadband communication system-Fundamental of Components and Network architecture		
2ND	Broadband communication system-Fundamental of Components and Network architecture		
3RD	Broadband communication system-Fundamental of Components and Network architecture		
4TH	Cable broadband data network- architecture, importance & future of broadband telecommunicationinternet based network		
5TH	Cable broadband data network- architecture, importance & future of broadband telecommunicationinternet based network		
6TH	Cable broadband data network- architecture, importance & future of broadband telecommunicationinternet based network		
7TH	SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications,and disadvantages		
8TH	ISDN - ISDN Devices interfaces, services, Architecture, applications		
9TH	BISDN -interfaces & Terminals, protocol architecture applications		
10TH	BISDN -interfaces & Terminals, protocol architecture applications		

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