Design of IIR filters from analog filters (Butterworth and Chebyshev) - impulse invariance method. Mapping of transfer functions: Approximation of derivative (backward difference and bilinear transformation) method, Matched z transforms, Verification for stability and linearity during mapping

TEXT BOOK:

1. **Digital signal processing – Principles Algorithms & Applications**, Proakis & Monalakis, Pearson education, 4th Edition, New Delhi, 2007.

REFERENCE BOOKS:

1. **Discrete Time Signal Processing**, Oppenheim & Schaffer, PHI, 2003.
2. **Digital Signal Processing**, S. K. Mitra, Tata Mc-Graw Hill, 3rd Edition, 2010.
3. **Digital Signal Processing**, Lee Tan: Elsivier publications, 2007

ANALOG COMMUNICATION

Subject Code	: 10EC53	IA Marks	: 25
No. of Lecture Hrs/Week	: 04	Exam Hours	: 03
Total no. of Lecture Hrs.	: 52	Exam Marks	: 100

UNIT - 1

RANDOM PROCESS: Random variables: Several random variables. Statistical averages: Function of Random variables, moments, Mean, Correlation and Covariance function: Principles of autocorrelation function, cross – correlation functions. Central limit theorem, Properties of Gaussian process.

UNIT - 2

AMPLITUDE MODULATION: Introduction, AM: Time-Domain description, Frequency – Domain description. Generation of AM wave: square law modulator, switching modulator. Detection of AM waves: square law detector, envelop detector. Double side band suppressed carrier modulation (DSBSC): Time-Domain description, Frequency-Domain representation, Generation of DSBSC waves: balanced modulator, ring modulator. Coherent detection of DSBSC modulated waves. Costas loop.

UNIT - 3

8

D.N...

H. O. D.
Dept. Of Electronics & Communication
Alva' Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

SINGLE SIDE-BAND MODULATION (SSB): Quadrature carrier multiplexing, Hilbert transform, properties of Hilbert transform, Pre-envelope, Canonical representation of band pass signals, Single side-band modulation, Frequency-Domain description of SSB wave, Time-Domain description. Phase discrimination method for generating an SSB modulated wave, Time-Domain description. Phase discrimination method for generating an SSB modulated wave. Demodulation of SSB waves.

UNIT - 4

VESTIGIAL SIDE-BAND MODULATION (VSB): Frequency – Domain description, Generation of VSB modulated wave, Time - Domain description, Envelop detection of VSB wave plus carrier, Comparison of amplitude modulation techniques, Frequency translation, Frequency division multiplexing, Application: Radio broadcasting, AM radio.

UNIT - 5

ANGLE MODULATION (FM)-I: Basic definitions, FM, narrow band FM, wide band FM, transmission bandwidth of FM waves, generation of FM waves: indirect FM and direct FM.

UNIT - 6

ANGLE MODULATION (FM)-II: Demodulation of FM waves, FM stereo multiplexing, Phase-locked loop, Nonlinear model of the phase – locked loop, Linear model of the phase – locked loop, Nonlinear effects in FM systems.

UNIT - 7

NOISE: Introduction, shot noise, thermal noise, white noise, Noise equivalent bandwidth, Narrow bandwidth, Noise Figure, Equivalent noise temperature, cascade connection of two-port networks.

UNIT - 8

NOISE IN CONTINUOUS WAVE MODULATION SYSTEMS: Introduction, Receiver model, Noise in DSB-SC receivers, Noise in SSB receivers, Noise in AM receivers, Threshold effect, Noise in FM receivers, FM threshold effect, Pre-emphasis and De-emphasis in FM,.

TEXT BOOKS:

1. **Communication Systems**, Simon Haykins, 5th Edition, John Willey, India Pvt. Ltd, 2009.
2. **An Introduction to Analog and Digital Communication**, Simon Haykins, John Wiley India Pvt. Ltd., 2008

D. V~

H.O.D.
Dept. Of Electronics & Communication
Alva' Institute of Engg & Technology
Mijar, MOODBIDRI - 574 225

REFERENCE BOOKS:
1. **Modern digital and analog Communication systems** B. P. Lathi, Oxford University Press., 4th ed, 2010,
2. **Communication Systems,** Harold P.E, Stern Samy and A Mahmond, Pearson Edn, 2004.
3. **Communication Systems:** Singh and Sapre: Analog and digital TMH 2nd, Ed 2007.

MICROWAVES AND RADAR

Subject Code	: **10EC54**	IA Marks	: 25
No. of Lecture Hrs/Week	: 04	Exam Hours	: 03
Total no. of Lecture Hrs.	: 52	Exam Marks	: 100

UNIT - 1

MICROWAVE TRANSMISSION LINES: Introduction, transmission lines equations and solutions, reflection and transmission coefficients, standing waves and SWR, line impedance and line admittance. Smith chart, impedance matching using single stubs, Microwave coaxial connectors.

UNIT - 2

MICROWAVE WAVEGUIDES AND COMPONENTS: Introduction, rectangular waveguides, circular waveguides, microwave cavities, microwave hybrid circuits, directional couplers, circulators and isolators.

UNIT - 3

MICROWAVE DIODES,

Transfer electron devices: Introduction, GUNN effect diodes – GaAs diode, RWH theory, Modes of operation, Avalanche transit time devices: READ diode, IMPATT diode, BARITT diode, Parametric amplifiers
Other diodes: PIN diodes, Schottky barrier diodes.

UNIT - 4

Microwave network theory and passive devices. Symmetrical Z and Y parameters, for reciprocal Networks, S matrix representation of multi port networks.

UNIT - 5

Microwave passive devices, Coaxial connectors and adapters, Phase shifters, Attenuators, Waveguide Tees, Magic tees.

10

D, V

H.O.D.
Dept. Of Electronics & Communication
Alva' Institute of Engg & Technology
Mijar, MOODBIDRI - 574 225