ANNEXURE I
ELECTRONICS AND COMMUNICATION ENGINEERING

1. ELECTRONIC DEVICES AND CIRCUITS: Semiconductor diodes – varactor diode – zener diode – Clippers and clampers-Transistors– FETs – UJT (characteristics only) – Power supplies – Rectifiers and Filters – HW, FW and Bridge type – RC , LC and CLC filters – Series and Shunt regulators – Transistor amplifiers – CE,CC and CB configurations – Biasing techniques-RC coupled – Transformer coupled amplifiers Differential amplifiers – Feedback, Power and Tuned amplifiers – Operational amplifiers – characteristics and applications – RC , LC and Crystal oscillators – Astable , Bistable and Monostable Multivibrators using Transistors and 555 timers- Schmitt Trigger – Sweep circuits – Miller and Bootstrap circuits.

2. CIRCUIT THEORY: Mesh current and Node voltage analysis – Crammer's Rule – Network theorems – Thevenin's, Norton's, Maximum Power transfer, Superposition and Reciprocity theorems–RC,RL,RLC Transients- Series and Parallel Resonance – Q- factor – Selectivity – Bandwidth –Linear wave shaping circuits. Transmission Lines – Characteristic Impedance –Reflection Coefficient – SWR – Transmission Line losses and Impedance matching.

3. ELECTRONIC MEASURING INSTRUMENTS AND AUDEO &VIDEO SYSTEMS
Analog Instruments – Extension of range of Ammeter, Voltmeter and Ohmmeter – FET voltmeter – Differential voltmeter – Digital instruments – Ramp –Dual Slope integration – successive approximation – digital frequency meter-digital LCR meter- CRO – CRT – time base generator – deflection sensitivity – triggered sweep circuits – CRO applications, AF Oscillator – RF Signal generator – AF and RF Power meters – Q meter – Distortion Factor Meter – Digital IC tester-Audio systems-Digital TV Fundamentals-LCD-HDTV-Smart TV-DTH-Touch screen technology.

4. INDUSTRIAL AND POWER ELECTRONICS: Thyristor family – SCR ,TRIAC, Power BJT –IGBT (characteristics, working principle and applications) — Series and Parallel Inverters– PWM inverters, – Single phase – SMPS – Off Line and On Line UPS – Opto electronic devices – LDR, Photo diode and transistor and Photo voltaic cell (characteristics and applications) – Transducers – LVDT – Strain Gauge, Thermistor, Thermocouple - Ultrasonics - Pulse echo flaw detector-Industrial heating methods-Basics of control systems-Transfer function-ROC-Open and closed loop systems(up to second order)

5. COMMUNICATION SYSTEMS: Analog – Need for modulation – Types of modulation – AM , FM , PM – Modulation Index – Bandwidth – Power requirements – Transmitters – Low level , High level and SSB types – Receivers – Super heterodyne – AM and FM receivers – characteristics – Sensitivity , Selectivity , Fidelity – IMRR and choice of IF – Wave Propagation – Ground , Sky and Space waves – Properties. Digital – Pulse modulation
– PCM , Delta modulation – Data codes – Synchronous and Asynchronous transmission – error detection and correction - digital modulation – ASK ,FSK, PSK and QAM – generation and detection – Multiplexing – TDM , FDM – Multiple Access – TDMA.

6. ADVANCED COMMUNICATION SYSTEMS: Antennas– radiation resistance – beam width – polarization – directivity – efficiency – bandwidth – gain – front to back ratio – folded dipole – arrays – broadside – end fire – Yagi , Log periodic , Turnstile antennas – Parabolic reflectors – beam width, gain and applications. Wave Guides – Rectangular – Dominant mode – Phase and Group velocity – Cut off wavelength - working principle and applications of Magnetron , Klystron ,TWT – Radar – range equation – Pulsed radars – indicators – duplexers – CW radars and MTI radars – Satellite communication – UP link and DOWN link frequencies – types of satellites – satellite on board – earth station systems – satellite applications – Fiber Optic communication – types of fibers – couplers, splices, connectors, switches , optical emitters and detectors – optical repeaters – Wave length Division multiplexing – Mobile Communication – cellular concept – AMPS , GSM , CDMAsystems.

7. DIGITAL ELECTRONICS: Number systems – Logic gates – Boolean algebra – Adders and Subtractors – Flip-flops – Registers and Counters – Memories – RAM, ROM, Flash ROM, NVROM – D/A converters – binary weighted – R-2R Ladder, - Counter type A /D Converter and Successive approximation A /D Converter.

8. MICROCONTROLLERS AND MICROPROCESSORS: 8051 Architecture – Instruction Set – subroutines – use of input and output machine related statements – time delay programme – assembler directives - peripheral ICs —— 8086 Architecture – Instruction Set – Features of Pentium and its Derivatives.

9. DATA COMMUNICATIONS AND COMPUTER NETWORKS: Transmission Media – twisted pair – UTP –STP –Coaxial cable – Optical fiber – comparison – Shannon Capacity theorem – Network Topologies – BUS, STAR , RING – switching – Packet and Message switching – OSI architecture and functions – CSMA , CDMA and token ring – properties and operations – Wireless LAN – Blue tooth technology – WAN architecture – Packet transmission – ARPA Net – ISP and ISDN architectures – WAN Protocols – X .25 , Frame Relay , ATM ,TCP / IP features and comparison –Ports and Sockets – Domain Name System – POP and SMTP server – File transfer protocol – Proxy server and Web server architecture.

ANNEXURE II
Number of Questions to be Set Unit Wise
ELECTRONICS AND COMMUNICATION ENGINEERING

UNIT NO	TOPICS	MARKS
I	**ELECTRONIC DEVICES AND CIRCUITS**	15
II	**CIRCUIT THEORY**	10
III	**ELECTRONIC MEASURING INSTRUMENTS**	11
IV	**INDUSTRIAL AND POWER ELECTRONICS**	10
V	**COMMUNICATION SYSTEMS**	15
VI	**ADVANCED COMMUNICATION SYSTEMS**	10
VII	**DIGITAL ELECTRONICS**	10
VIII	**MICROCONTROLLERS AND MICROPROCESSORS**	12
IX	**DATA COMMUNICATIONS AND COMPUTER NETWORKS**	07
	Total	**100**

ANNEXURE III

MODEL QUESTIONS FOR ELECTRONICS AND COMMUNICATION ENGINEERING

1. The largest unsigned decimal number that can be represented in binary using 6 bits is

    1. 63
    2. 64
    3. 127
    4. 128

2. A 0-10mA Ammeter with 30Ω internal resistance is to be extended to measure up to 20mA . What value of Shunt resistance is to be connected?

    1. 10 Ω
    2. 20 Ω
    3. 30 Ω
    4. 60Ω

3. The maximum value of modulation index in amplitude modulation is

    1. 10
    2. 5
    3. Infinite
    4. 1