ANNEXURE -I

APPLIED ELECTRONICS &INSTRUMENTATION ENGG.

UNIT-1:Electrical Engineering: DC Circuits and Network Theorems,single phase A.C.circuits,Heating effects of Electrical current,Transformers ,DC&AC machines, Ohm's law-Kirchhoff 'slaw-star delta transformation basics of DC machines motors and generators, Alternators,

UNIT-2: Industrial electronics and control engineering:

Power and opto Electronic devices,industrial heating and welding,Basic concepts of control systems and transfer functions,block diagram algebra and signal flow graph,time and frequency response analysis.Phototransistor, photoconductive device, photo multiplier, solar cell, opto-coupler, dot matris and seven segment displays, bar graph, basic principles of induction heating, dielectric heating and resistance welding basics of open loop and closed loop control systems-Transfer functions-signal flowgraphs-Time response of first order and Second order system-concept of stability (Routh Hurwitz criterion) frequency response by bode plot.

UNIT-3:Electronics: Resistor,capacitor and inductor specifications and applications of transformers. basics of switches, fuses, relays and microphones, Semi conductor materials, PNjunction formation, forward and reverse biasing voltages, formation working and configurations of PNP and NPN transistors, Zener diode, FET, MOSFET diode as rectifier C,LC and CLCfilter circuits, RC coupled amplifier, transformer coupled amplifier, Darlington and, oscillator principle, RC phase shift and wien bridge oscillator, Boot strap sweep circuit, miller sweep circuit, bistable, astable and monostable multivibrator using transistor.

UNIT-4: Digital Electronics: Number systems, logic gates, half adder and subtractor, full adder RS. T. Dand Master-slave JK type flip-flops counters, up/down counter, ring counter, Registers shift registers, universal shift register, basic memories (RAM and ROM ADC (Counter method Successiveapproximation methodjandDAC.(R-2Rmethod, Binary weightedmethod)

UNIT-5 Electronic Measuring instruments: Analog Instruments Extension of range of Ammeter, Voltmeter and Ohmmeter FET volimeter Differential voltmeter Digital instruments Ramp-successive approximation digital frequency meter. CRO-CRT-time basegenerator-deflection sensitivity triggered sweep circuits CRO applications-AF Oscillator RFSignal generator AF and RF Power meters - Q meter - Digital IC tester-LogicAnalyzer.

UNIT-6:Process Instrumentation:Fundamentals ofinstrumentation basic transducertheory forthe measurement of displacement(LVDT, Potentiometer, inductive, capacitive,), angular velocity temperature(Thermometers, RTD, Thermocouple, thermister, Pyrometers) pressure(ela sticelements, Strain gauge piezo electric), Flow (Head type flow meters, rotameter Electromagneticflow meter, anemometers, Ultrasonic flow meter) weight, humidity, level, viscosityand density,

UNIT-7: Process Control: On-off Control, Proportional, Integral and Derivative Controllers, PIDController, Tuning of PID Controller. Actuators (Pneumatic, electro-pneumatic Hydraulic) basics ofcontrol yalves, Cascade Controller, Ratio Controller, Adaptive Control, Line Diagrams, LetterCodes .

UNIT-8: Linear IC Applications:Introduction to operational amplifiers,applications of operational amplifiers,active filters,555 timer IC,Non linear applications of op-amps. Characteristics of Operational Amplifier, Applications of Operational Amplifier like (Summer, Integrator, Differentiator, Inverter, VoltageFollower, V to 1 Converter, I to V Converter, Comparator, Square wave Generator,Mono stable multivibrator,Astable Multivibrator,weinbridgeOscillator,Instrumentation Amplifier,schimitt Trigger,Applications of 555 timer,Phase locked loop.

UNIT-9:Analytical and biomedical instrumentation: Electromagnatic spectrum,Mono chromator,Light sources and Detectors,spectrophotometer(UV,Visible,IR),FlamePhotometer,polarimeter,Gas Analyzer,Mass spectrometer,Liquid chromatography and Gas Chromatography,Basics of Diagnostic Equipment ECG,EEG,EMG Blood flow measurement,pace Maker,Defibrillator,X-ray equipment,CAT,PH, Conductivity.

UNIT-10:Microcontroller&PLCs: Architecture of ARM Microcontrollers,instruction set of ARM Micro controllers,Advanced ARM Micro controllers,Arduino controller,applications using arduino, Basics of PLC-Architecture and instruction set of PLC and applications,Robot, CNC Machine.

ANNEXURE-II

Number of questions to be set.

APPLIED ELECTRONICS & INSTRUMENTATION ENGG.

UNIT NO	TOPICS	MARKS
I	Electrical engineering	06
II	Industrial electronics & control Engg(5+4)	09
III	Electronics	12
IV	Digital Electronics	10
V	Electronic Measuring Instruments	08
VI	Process Instrumentation	14
VII	Process control	14
VIII	Linear IC applications	08
IX	Analytical &Biomedical Instrumentation(6+5)	11
X	Micro controllers &PLCs(5+3)	08
		100