ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
III B.Tech. I Semester Regular Examinations, January 2014
Power Electronics
(EEE)

Time: 3 hours **Max Marks: 70**

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)
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1. a) Explain the turn on methods of an SCR. 7M

   b) Draw and explain the static V-I characteristics of an SCR. 7M

2. Explain any three commutation methods used for SCR. 14M

3. Briefly explain dv/dt , di/dt, over voltage and over current protections of a Thyristor. 14M

4. a) Draw the circuit diagram and wave forms of output voltage and load current of a 1 φ full-converter for RL load. Derive the equations for average and RMS output voltage. 8M

   b) Explain the effect of freewheeling diode on a 1 φ half wave controlled rectifier with necessary diagrams. 6M

5. a) A 3 φ fully controlled bridge rectifier circuit is fed from 440V, 50HZ, 3 φ ac supply. The average load current is 50 A. Find the overlap angle if α = 15⁰ and source inductance of 0.1 mH per phase. 8M

   b) Explain the effect of source inductance on a 1 φ fully controlled rectifier with neat diagrams. 6M

6. a) Explain the operating modes of a TRIAC with relevant diagrams. 7M

   b) Draw the circuit diagram and wave forms of output voltage and load current of a 1 φ full wave AC voltage controller for RL load. Derive the equations for average and RMS output voltage. 7M

7. a) Explain the time ratio control and current limit control in detail. 7M

   b) Explain the operation of Jone's chopper with relevant circuit and waveforms. 7M

8. Write short notes on the following

   a) Mc Murray and Bedford inverter.

   b) Series Inverter 14M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
III B.Tech. I Semester Regular Examinations, January 2014
Transmission of Electric Power
(EEE)

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)
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1. a) Write a short note on geometric mean distance and geometric mean radius. 6M

   b) Calculate the loop inductance per km of single – phase transmission line comprising of two parallel conductors 1m apart and 1.25 cm in dia. Also calculate the reactance of the transmission line. Frequency is 50Hz 8M

2. a) What is charging current? How it can be calculated? What is its effect? 6M

   b) Calculate the capacitance of a 100 km long 3-phase, 50Hz overhead transmission line consisting of 3 conductors , each of diameter 2cm and spaced 2.5 m at the corners of an equilateral triangle 8M

3. Derive the expressions for efficiency and regulation and A, B, C, D parameters of a nominal-π medium length transmission line by using its phasor diagram. 14M

4. Derive the expressions for voltage and current distributions over a long line. Explain the significance of characteristic impedance loading in connection with the long lines. 14M

5. Derive the expression for transient current wave, show that transient current is sum of incident current, and reflected current 14M

6. a) What is an insulator? Where and why the insulators are used in power systems 7M

   b) In a 33kv overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find (i) The distribution of voltage over 3 insulators and (ii) String Efficiency. 7M

7. a) Discuss the effect of the size of the conductor on Corona loss. 7M

   b) Derive the expressions for sag and tension when the supports are at equal heights. 7M

8. a) Write short notes on: (i) Intersheath grading.   (ii) Capacitance grading. 6M

   b) A 33 kV single core cable has a conductor diameter of 10 mm and sheath of inside diameter of 40 mm. Find the maximum and minimum stress in the insulation. 8M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
III B.Tech. I Semester Regular Examinations, January 2014
Electrical and Electronics Measurements
(EEE)

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)

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1. a) Explain how the current range of PMMC instrument is extended with help of shunts

   7M

   b) Discuss about Errors and Compensations of Measuring Instruments.

   7M

2. Explain the construction details of Wound and Bar Type Current Transformer for reduction of Ratio and Phase Angle Errors. Also, Explain the features incorporated in the windings to reduce the Leakage Reactance.

   14M

3. Draw a neat sketch showing the construction of a Single Phase Induction Type Energy Meter. Give the theory and operation of the Instrument.

   14M

4. a) Draw the circuit diagram of a basic slide wire DC potentiometer. Explain its Working.

   10M

   b) Write the applications of AC Potentiometer.

   4M

5. a) Explain the measurement of High Resistance Loss of Charge Method.

   7M

   b) Draw the Anderson's Bridge and Explain its Working.

   7M

6. a) Explain Six Point Method.

   7M

   b) How B-H Curve is determined using Method of Reversals.

   7M

7. a) What do you mean by Lissajous Pattern? How do you measure them using a CRO?

   7M

   b) Describe briefly measurements of frequency, phase angle and voltage by using CRO.

   7M

8. a) Explain the method of measuring voltage in Successive Approximation Method.

   7M

   b) Give salient features of Digital Multimeters.

   7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
III B.Tech. I Semester Regular Examinations, January 2014
Electrical Machines-III
(EEE)

Time: 3 hours   Max Marks: 70

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)
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1. a) Explain the difference between (a) integral slot and fractional slot windings (b) single and double layer windings (c) full pitch and short pitch coils   8M

    b) A 3 phase, 8 pole, 750 rpm synchronous alternator has 72 slots. Each slot has 12 conductors and winding is short pitched by 2 slots. Find pitch factor and breadth factor. If flux per pole is 0.06wb, find induced emf per phase.   6M

2. a) Explain the method of suppressing harmonics generated in synchronous generator.   5M

    b) The flux distribution curve of a smooth core 50 Hz generator is B= $\sin\theta+0.2 \sin3\theta+0.2 \sin 5\theta+0.2 \sin 7\theta$ wb/m^2 where θ is the angle measured from neutral axis. The pole pitch is 35 cm, the core length is 32 cm and stator coil span is four-fifth of pole pitch. Find equation for emf induced in one turn and its rms value.   9M

3. a) Explain the two reaction theory of salient pole machine. Draw the phasor diagram and obtain regulation of an alternator using this theory   8M

    b) Find the voltage regulation at full load 0.8 pf lagging for a 3 phase 1500 kVA, 6600V, star connected alternator having an armature resistance of 0.09ohm per phase and a synchronous reactance of 8.5 ohm/phase.   6M

4. a) Discuss the effect of change of excitation and mechanical power input on parallel operation of alternators.   8M

    b) A 2 MVA, 3 phase, star connected, 8 pole, 750 rpm alternator is operating on 6000V bus bars. Synchronous reactance is 6 ohms/ phase. Find synchronizing power and torque per mechanical degree of displacement for full load, 0.8 pf lagging.   6M

5. a) Explain different methods of starting of synchronous motor   7M

    b) A 6600V, 3 phase star connected synchronous motor works at constant voltage and constant excitation. Its synchronous impedance is 2+j20 ohm/ phase. When the input is 1000kW, the pf is 0.8 leading. Find the pf when the input is increased to 1500kW.   7M

6. Briefly discuss any two different methods used for starting of one phase induction motor with neat diagram   14M

7. Draw the phasor diagram of an ac series motor. How can its performance be analyzed? Draw its typical characteristics.   14M

8. a) What is a synchro? Draw a connection diagram of a synchro-transmitter motor system and explain its working?   7M

    b) In a two phase, 50Hz, 2 servomotor pole the air gap power for the balanced positive sequence and balance negative sequence operation for Vr=Vc=100V and S= 0.4 are 7W and 5W respectively. Find the resultant torque in synchronous watts and N-m if Vs=200∟0° and Vc=120∟-60°for s=0.4   7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
III B.Tech. I Semester Regular Examinations, January 2014
Environmental Science
(EEE)

Time: 3 hours   Max Marks: 70

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)

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1.	a)	Write a note on public awareness of environmental studies	7M
	b)	Discuss about scope of environmental studies	7M
2.	a)	Write short notes on deforestation.	6M
	b)	What are the major causes for drought?	8M
3.	a)	What are the pros and cons of mining activity?	7M
	b)	Explain the uses of natural resources for sustainable development.	7M
4.	a)	What are the adverse effects of air pollution on living beings?	8M
	b)	Write a note on disaster management.	6M
5.	a)	Discuss on producers, consumers and decomposers.	8M
	b)	Discuss the process of ecological succession.	6M
6.	a)	Explain the endemic and endangered species of India.	7M
	b)	Discuss the Hot spots of biodiversity in India.	7M
7.	a)	Define watershed management and explain its objectives.	7M
	b)	Discuss the salient features of Wildlife (Protection) Act, 1972	7M
8.	a)	Explain the necessity of value education.	6M
	b)	Discuss about role of Information Technology on environment and human health.	8M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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III B.Tech. I Semester Regular Examinations, January 2014

Linear and Digital Integrated Circuits Applications

(EEE)

Time: 3 hours   **Max Marks: 70**

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)

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1. a) Distinguish between digital and linear IC's   [6]

    b) Draw the block schematic of Op-Amp and explain each block.   [8]

2. a) Mention the types of Op-Amp applications with examples. Briefly explain about
        instrumentation amplifier.   [8]

    b) How the Op-Amp acts as a V-I converter?   [6]

3. a) Describe monostable mode of operation of IC 555 timer. Draw the necessary
        waveforms and expressions   [8]

    b) Explain any two applications of PLL.   [6]

4. a) Define the following terms for DAC converter.

            (i) Resolution (ii) Settling time   (iii) Conversion time   [8]

    b) Determine the resolution of 8 bit ADC for 10V input.   [6]

5.   Explain CMOS transmission gate operation and its applications   [14]

6. a) What are the current sourcing and sinking applications of TTL 74XX IC's?   [6]

    b) Draw circuit for TTL NAND gate and explain operation and truth table.   [8]

7. a) Design a full adder circuit using 3X8 decoder and suitable gates.   [6]

    b) Design a BCD to Excess – 3 code converter with BCD to decoder and four OR.   [8]

8. a) Design 3- bit binary up/down counter with direction control M. Use J-K flip flops   [8]

    b) Draw the circuit diagram of a 4-bit Right shift and left shift register and explain its
        operation.   [6]

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