Hall Ticket Number :										

R-11/R-13

Code: 1G356

III B.Tech. I Semester Supplementary Examinations November 2016

Linear and Digital Integrated Circuits Applications

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Explain the block diagram of OP-AMP.
   b) Explain AC characteristics of OP-AMP.

2. a) Explain the construction of Instrumentation amplifier and derive expression for gain.
   b) With relevant waveforms explain the operation Integrator.

3. a) Explain the operation of astable multivibrator using 555 with waveforms.
   b) Draw block diagram PLL and explain the operation.

4. a) Explain the operation of binary weighted resistor DAC and drive equation for output voltage.
   b) Explain the operation of counter type ADC.

5. a) Explain the operation of 2-input NOR gate using CMOS logic.
   b) Derive expression for rise and fall time for CMOS circuit.

6. a) Explain the operation of 2-input TTL NAND.
   b) Compare different logic families.

7. a) Explain the Design of 3 to 8 Decoder.
   b) Explain Half & Full adders with truth tables.

8. a) Explain any two flip-flops using truth tables.
   b) Explain the construction and operation of SISO shift register.

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Hall Ticket Number :										

R-11/R-13

Code: 1G251

III B.Tech. I Semester Supplementary Examinations November 2016

Electrical Machines-III

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any ***five*** questions
All Questions carry equal marks (14 Marks each)

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1. a) Deduce the relation between the number of poles, the frequency and the speed of the alternator? 7M
   b) The armature of a 1 phase alternator is completely wound with 100 single turn coils distributed uniformly. The induced emf in each turn is 2 V. what is the emf induced in the whole winding with all 100 coils connected in series? 7M
2. a) What is armature reaction? Explain the effect of armature reaction on the terminal voltage of an alternator at unity power factor load? 7M
   b) What is synchronous impedance? How can it be measured in laboratory? 7M
3. a) Describe the mmf method for predetermining the voltage regulation of an alternator? 7M
   b) Compare synchronous impedance method and ampere turn method of predetermining regulation of alternators? 7M
4. a) Explain what is meant by synchronizing of alternators. What are the various methods of synchronizing? 8M
   b) Synchronizing lamps are connected across 440V alternator running at 50 Hz and 50.6 Hz respectively. How often will the lamps light up in 1 minute and what is the periodicity of the high frequency component? 6M
5. a) Explain an experimental method for determining V curves and inverted V curves for a synchronous motor? 7M
   b) Briefly describe the phenomenon of hunting in a synchronous machine. How is it remedied? 7M
6. a) Describe the constructional features and operating characteristics of a shaded pole motor. Give its uses? 8M
   b) Explain the cross field theory as applied to a single phase induction motor? 6M
7. a) Why are the compensating winding and the interpole winding is used in a universal motor for ac operation? 7M
   b) Describe the constructional features of 'variable reluctance' type and permanent magnet' type stepper motors. Compare them? 7M
8. a) What are the characteristic of servomotor? What is the difference between ac servomotor and two phase induction motor? 10M
   b) Calculate the stepping angle for a 3 stack. 16 tooth variable reluctance motor? 4M

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Hall Ticket Number :										

R-11/R-13

Code: 1G252

III B.Tech. I Semester Supplementary Examinations November 2016

Transmission of Electric Power

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any* ***five*** questions
All questions carry equal marks (**14 Marks** each)

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1. a) Derive an expression for a loop inductance of a single phase line 8M
   b) Calculate the inductance of each conductor in a three phase three wire system when the conductors are arranged in the horizontal plane with spacing such that D_{31} = 3 m, D_{12} = D_{23} = 2.5 m. The conductors are transposed and have a diameter of 3 cm. 6M
2. a) Deduce the expression for line to neutral capacitance for a three phase overhead line when the conductors are unsymmetically placed but transposed 8M
   b) Describe the effects of Skin and Proximitity events occurred in transmission lines 6M
3. a) Deduce an expression for voltage regulation of short transmission line with vector diagram. 6M
   b) A 100 km long 3-phase 50 Hz transmission line has the following line constants: Resistance per phase per km = 0.1 ohms, Reactance per phase per km = 0.3 ohms, Susceptance per phase per km = 9 x 10^{-6} S. If the line supplies load of 30 MW at 0.9 p.f. lagging at 66 kV at the receiving end, calculate
      (i) sending end voltage
      (ii) transmission efficiency by nominal T method. 8M
4. a) Derive the generalized constants for long transmission line from fundamentals. 8M
   b) Briefly explain the effects of Surge impedance loading of long transmission line with illustrations. 6M
5. a) What are the different types of transients and describe the propagation of surges in the power system. 6M
   b) Describe the effects on transmission lines terminated with T-junction and lumped reactive junction. 8M
6. a) Show that in a string of suspension insulators, the disc nearest to the conductor has the highest voltage across it. 8M
   b) Describe the phenomenon of Capacitance grading and static shielding in insulators. 6M
7. a) Describe the various methods for reducing Corona effect in an overhead transmission line. 8M
   b) Explain the significance of wind and ice on the weight of the transmission conductor. 6M
8. a) Explain the desirable characteristics of insulating materials used in the Underground Cable. 8M
   b) Obtain the expression for the most economical conductor size of a single core Cable. 6M

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Hall Ticket Number :										

R-11/R-13

Code: 1G253

III B.Tech. I Semester Supplementary Examinations November 2016

Power Electronics

(Electrical & Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any* ***five*** questions
All questions carry equal marks (**14 marks** each)

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1. a) Explain the various types of triggering methods of SCR briefly? Which is the universal method? Why? 7M
   b) Define Latching and Holding currents as applicable to SCR and state the merits and demerits of thyristor? 7M
2. a) What is Commutation? What are different methods of Commutation? Explain any one method of Commutation? 7M
   b) Write a short note on series and parallel connections of SCR's? 7M
3. a) What are dv/dt and di/dt rating of SCRs? What happens if these ratings are exceeded? Explain? 7M
   b) Explain various types of coding methods applicable to semi conductor devices? 7M
4. a) Explain the operation of single phase half wave converter for $\alpha=60^0$ with RL load and with freewheeling diode. Derive the average output voltage and current expressions. 7M
   b) A resistive load of 10Ω is connected through a half wave SCR circuit to 220V, 50Hz, single phase source. Calculate the power delivered to load for a firing angle of 60^0. Also find the value of input power factor. 7M
5. a) Explain the working of a three phase full converter with R load for the firing angles of 60^0 and 150^0. 7M
   b) A three phase fully controlled bridge converter is connected to three phase ac supply of 400V, 50Hz and operator with a firing angle $\alpha=\pi/4$. The load current is maintained constant at 10A and the load voltage is 360V. Compute
   (i).Source inductance Ls (ii).Load Resistance R (iii).Overlap angle μ. 7M
6. a) With neat circuit diagram and waveforms explain the principle of operation of single phase midpoint type step down cyclo converter? 7M
   b) Explain in detail the modes of operation of TRAIC? 7M
7. a) Explain about Jone's chopper with neat circuit diagram and waveforms? 7M
   b) Draw the schematics of step-down and step-up choppers and derive for an expression for output voltage in terms of duty cycle for a step-up and step-down chopper. 7M
8. a) Describe the working of a Mc Murray Inverter. What is its main drawback? Explain how this drawback can be overcome. 7M
   b) What is pulse width modulation? Explain different PWM techniques in brief? 7M

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Hall Ticket Number :										

Code : 1G254

R-11/R-13

III B.Tech. I Semester Supplementary Examinations November 2016

Electrical and Electronics Measurements

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any* ***five*** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) Explain the working principle of PMMC instrument with a neat sketch. 10M
   b) State the advantages and disadvantages of PMMC instrument. 4M

2. a) Explain the effect of secondary burden on the ratio and phase angle errors of a current transformer. 4M
   b) A current transformer with a bar primary has 300 turns in its secondary winding. The resistance and reactance of secondary circuit are 1.5 Ω and 1.0 Ω respectively including the transformer winding. With 5A flowing in the secondary winding. The magnetizing mmf is 100 AT and the iron loss is 1.2 W. Determine the ratio and phase angle errors. 10M

3. a) Explain how do you measure reactive power in a 3-phase circuit with the help of only one wattmeter? Draw the relevant circuit and phasor diagrams. 8M
   b) Two Wattmeter's are connected to measure power in a 3-phase network. The two readings are 200 w and 1000 w respectively. If another wattmeter be connected such that its current coil is in one phase and the potential coil is across the other two phase terminals, what will it read? Also, estimate the reactive power of the network. 6M

4. a) Explain the principle of operation of co-ordinate type A.C potentiometer. 10M
   b) Explain clearly how such a potentiometer can be employed for measurement of unknown inductance. 4M

5. Describe the working of low voltage Schering Bridge. Derive the equations for capacitance and dissipation factor. Draw the phasor diagram of the bridge under condition of balance. 14M

6. a) Explain the method of measuring core losses by using Maxwell's bridge method. 7M
   b) Explain the step by step method for determination of B-H loop. 7M

7. a) Derive the expression for vertical deflection on the screen of a CRT. 8M
   b) Explain the functioning of time base generator in a CRO with neat diagram. 6M

8. a) Explain about Successive approximation type DVM. 8M
   b) Explain the working of Digital Multi-meter 6M

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Hall Ticket Number :										

R-11/R-13

Code: 1GC52

III B.Tech. I Semester Supplementary Examinations November 2016

Environmental Science

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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1.		What is an Environment? Write briefly about scope and importance of Environmental studies.	14M
2	a)	Explain dams and their effects on forests and tribal people.	8M
	b)	Justify the necessity of developing non-conventional sources of energy.	6M
3	a)	What is soil erosion? How can it be checked?	7M
	b)	Discuss the alternate methods of Insect control avoiding the use of pesticides.	7M
4	a)	Describe the adverse effects and control of noise pollution.	8M
	b)	Explain about any two pollution case studies.	6M
5		Define ecosystem? Explain about various components of an ecosystem.	14M
6	a)	List the main biogeographical zones in India.	7M
	b)	India is one of the mega diversity nation explain.	7M
7	a)	Write a note on Urban problems related energy.	7M
	b)	Explain the concept of sustainable development.	7M
8	a)	Explain the necessity of value education.	7M
	b)	Enumerate the role of information technology in environment and human health.	7M

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