Hall Ticket Number :										

Code : 1G356 **R-11 / R-13**

III B.Tech. I Semester Regular & Supplementary Examinations Nov/Dec 2015

Linear and Digital Integrated Circuits Applications

(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.		Discuss DC characteristics of OP amps and explain about OP amp block diagram	14M
2.	a)	Explain with neat circuit about OP-Amp difference amplifier	6M
	b)	Draw and explain Op-amp integrator and differentiator	8M
3.		Write short notes on the following	
		(a) applications of PLL	7M
		(b) Block schematic of PLL	7M
4.		Explain with diagrams about Successive approximation ADC and R_2R ladder DAC	14M
5.	a)	Discuss in detail about different CMOS logic families	8M
	b)	Draw and explain 2- input CMOS EX–OR gate	6M
6.		Discuss CMOS/ TTL interfacing and Comparison of different logic families	14M
7.		Define decoder and explain with neat diagram the functionality of 3 to 8 decoder	14M
8.	a)	Compare synchronous asynchronous circuits	4M
	b)	Explain with neat diagram about universal shift register	10M

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Hall Ticket Number :										

R-11/R-13

Code : 1G254

III B.Tech. I Semester Regular & Supplementary Examinations, Nov/Dec 2015

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) Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. Describe the method of damping used in these instruments. 10M

   b) What is swamping resistance? Explain its purpose in instruments. 4M

2. a) Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expressions for ratio and phase angle errors. 10M

   b) Explain the effect of opening the secondary circuit of a current transformer when the primary winding is energized. 4M

3. Explain how the following adjustments are made in a single phase induction type energy meter

   (i) Lag adjustment
   (ii) Adjustment for friction compensation
   (iii) Creep
   (iv) Overload compensation
   (v) Temperature compensation 14M

4. Describe the construction and working of a co-ordinate type a.c potentiometer. How is it standardized? What are the functions of the transfer instrument and the phase shifting transformer? 14M

5. a) Derive the equations of balance for an Anderson's bridge. Draw the phasor diagram for conditions under balance. Discuss the advantages and disadvantages of the bridge. 7M

   b) The arms of a five node bridge are as follows:

   arm ab: an unknown impedance (R1, L1) in series with a non-inductive variable resistor r1, arm bc: a non-inductive resistor R3 = 100Ω, arm cd: a non-inductive resistor R4=200Ω, arm da: a non-inductive resistor R2 =250Ω, arm de: a non-inductive variable resistor r, arm ec: a loss-less capacitor C=1μF, arm be: a detector. An a.c. supply is connected between a and c. Calculate the unknown resistance and inductance when under balance conditions r1=43.1Ω and r=229.7Ω. 7M

6. Describe the method for determination of B-H curve of a magnetic material using:

   (i) Method of reversals and
   (ii) Step by step method. 14M

7. Describe the different parts of a CRT with a neat sketch. 14M

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

Code : 1G251

III B.Tech. I Semester Regular & Supplementary Examinations, Nov/Dec 2015

Electrical Machines-III

(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 synchronous generator	6M
	b)	Derive the EMF equation of a synchronous generator	5M
	c)	An 8-pole, 3-phase, 60^o spread double layer winding has 72 coils in 72 slots. The coils are short pitched by two slots. Calculate the winding factor for the fundamental harmonic	3M
2.	a)	Explain about the Harmonics in generated EMF wave form	7M
	b)	What are the characteristics of Alternator on load and explain it with its equivalent circuit and phasor diagrams	7M
3.		Explain how voltage regulation of alternator is determined by zero power factor method and also write its advantages	14M
4.	a)	What are the conditions necessary for synchronization of alternators? Also explain the synchronization of 3-phase alternators using “Three Dark lamp Method”	7M
	b)	Two similar single phase alternators are running in parallel. Their EMF’s are 100V and 150V respectively and the impedance of each is (0.2+j1.0)Ω. Find the terminal voltage, current and power supplied by each machine to a load impedance of (2+j3)Ω	7M
5.	a)	Draw and explain about V and inverted V-curves of a synchronous motor	7M
	b)	What is synchronous condenser? What are the advantages of synchronous condenser	7M
6.		Explain clearly about double revolving field theory and cross field theory?	14M
7.	a)	Explain the function of compensating winding in A/C series motors	6M
	b)	Explain the principle of operation and construction of universal motor. Also write its advantages and disadvantages	8M
8.		Write briefly about servo motors? Also explain clearly about D.C servo motors and A.C servo motors	14M

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Hall Ticket Number :										

R-11/R-13

Code : 1GC52

III B.Tech. I Semester Regular & Supplementary Examinations, Nov/Dec 2015

Environmental Science

(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) Write the multidisciplinary nature of Environmental Studies 7M
   b) Write the different programmes and activities by which awareness can be created among public on environmental issues 7M

2. a) What are the impacts of over utilization of surface and ground water? 7M
   b) Write an account of the growing energy needs with special reference to India. 7M

3. a) Describe the ill effects of chemical fertilizers and pesticides in agriculture 8M
   b) What is the role of the individual in the conservation of natural resources (Write any three) 6M

4. a) What is pollution? Briefly describe the sources, effects and control of air pollution 8M
   b) Write short notes
      (i) e-waste
      (ii) cyclones 6M

5. a) What are the ecological impacts of degradation of aquatic ecosystems in India? 6M
   b) Explain water and carbon cycles. 8M

6. a) What are the threats leading to loss of bio-diversity? 7M
   b) What are the hot spots? Discuss Indian hot spots of bio diversity. 7M

7. a) Discuss the advantages and methods of rain water harvesting. 7M
   b) Write short notes on Environment Protection Act and Wild life Protection Act. 7M

8. a) Write a brief account of family welfare programmes in India. 7M
   b) Write short notes on
      (i) value education
      (ii) AIDS 7M

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Hall Ticket Number :										

R-11/R-13

Code : 1G253

III B.Tech. I Semester Regular & Supplementary Examinations, Nov/Dec 2015

Power Electronics

(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)	Draw and explain static characteristics of thyristor.	6M
	b)	Explain the two transistor analogy of the thyristor	8M
2.	a)	Draw and Explain synchronized UJT triggering circuit for SCR.	6M
	b)	Describe the operation of a class B commutation circuits with waveforms	8M
3.	a)	Explain about Snubber circuit and its design aspects?	8M
	b)	Brief about the function of heat sink?	6M
4.	a)	Explain with necessary waveform, the operation of a single phase mid-point converter with resistive load.	9M
	b)	Find the expression for the average output voltage and current of a single phase mid-point converter with resistive load.	5M
5.	a)	Describe the operation of a three phase half controlled bridge converter with RL load.	9M
	b)	Derive an expression for the average output voltage and current of a three phase half controlled bridge converter with resistive load	5M
6.	a)	List the advantage and disadvantage of single-phase Full-wave ac voltage regulator.	4M
	b)	Derive the expression for RMS value of output voltage (RL-load) of single-phase full-wave ac voltage regulator.	10M
7.	a)	Describe the operating principle of step down chopper for continuous current conductions mode of operation.	7M
	b)	Describe the operating principle of step up chopper for continuous current conductions mode of operation.	7M
8		Draw the waveforms and discuss the performance of following methods of pulse-width modulation control used in inverter. i. Single-pulse PWM ii. Multiple-pulse PWM and iii. SPWM.	14M

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Hall Ticket Number :										

Code : 1G252 **R-11 / R-13**

III B.Tech. I Semester Regular & Supplementary Examinations Nov/Dec 2015

Transmission of Electric Power

(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) What factors must be taken into account while calculating the resistance of overhead line conductors. How are these factors accounted for? 7M

   b) Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are unsymmetrical placed but lines are un-transposed 7M

2. a) A 3-phase , 50hz, 66kv over head transmission line has conductors arranged at the corners of an equivalent triangular of 3m sides and the diameter of each conductor is 1.5cm determine 'L' and 'C' per phase, if l=100km. also calculate charging current 7M

   b) Calculate the capacitance per phase of a three-phase three-wire transposed system when the conductors are arranged at the corners of a triangle with sides measuring 1.5m, 2m, and 3m. Diameter of each conductor is 1.3 cm. 7M

3. a) Derive the expressions for the ABCD constants for the nominal-π circuit and nominal-T circuit of a medium transmission line. 7M

   b) The following data refers to a 50 Hz, three-phase transmission line: length 10 km; sending-end voltage =11 kV; load delivered at receiving end 100 kW at 0.8 p.f. lag; resistance of each conductor = 0.4 ohms/ km; reactance per phase = 0.45 ohms / km. Find (i) receiving-end voltage (ii) line current and (iii) efficiency of transmission. 7M

4 a) Explain the surge impedance loading of transmission line. 4M

   b) A=D=0.936+j 0.016; B=33.5+j138 ohms; C=(-5.18+j914) 10^{-6}mhos. The load at the receiving end is 50 MW at 220 kV with a power factor of 0.9 lagging. Find the sending end voltage and regulation of line. 10M

5. a) Discuss the phenomenon of wave reflection and refraction. Derive an expression for the reflection and refraction coefficients. 7M

   b) Two stations are connected together by an underground cable having a surge impedance of 50 ohms joined to an overhead line with a surge impedance of 400 ohms. If a surge having a maximum value of 110 kV travels along the cable towards the junction with the overhead line, determine the value of the reflected and the transmitted wave of voltage and current at the junction. 7M

6. a) What do you mean by string efficiency? How can it be improved? 7M

   b) Each conductor of a 33 kV, 3-phase system is suspended by a string of 3 similar insulators; the capacitance of each disc is 10 times the capacitance to ground. Calculate the voltage across each insulator and also determine the string efficiency. 7M

7. a) What are the disadvantages of corona? Explain how the corona considerations affect the design of a line. 7M

   b) Explain the effect of wind and ice loading are taken into account while determining the sag and stress of an overhead line conductor. 7M

8. a) Classify the underground cables according to various parameters. Give the applications of each type of the cable. 7M

   b) A three-phase, single core, lead covered cable has radius of core 0.5 cm and internal diameter of sheath 6 cm. Its 3 insulating materials A, B, and C have relative permittivity of 4, 4, and 2.5 with maximum permissible stress of 50, 40, and 30 kV/cm respectively. Find the operating voltage of the cable. 7M

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