Code : 1G254

R11

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Electrical and Electronics Measurements

(Electrical & Electronics Engineering)

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) Describe the construction and working of PMMC Instrument. 7M

   b) The inductance of a moving iron ammeter with a full scale deflection of 90^0 at 1.5A is given by the expression $L = [200 + 40\theta - 4\theta^2 - \theta^3]\mu H$, where θ is the deflection in radians from the zero position. Estimate the angular deflection of pointer for a current of 1.0 A. 7M

2. a) Discuss the major sources of errors in C.T. 7M

   b) Derive the expression for Ratio and Phase Angle Errors. 7M

3. a) Describe the constructional details and working principle of the Single Phase Dynamometer Wattmeter. 7M

   b) Explain with neat diagram of Three Phase Energy Meter. 7M

4. a) Describe the circuit diagram of AC Polar Type Potentiometer. 7M

   b) Why Standardization is required in DC potentiometer. Explain? 7M

5. a) How Schering Bridge is used for the measurements of unknown capacitor? Derive its balance equation. 7M

   b) Explain how Wein's Bridge can be used for experimental determination of frequency. Derive the expression for frequency in terms of bridge parameters. 7M

6. a) What are magnetic measurements? Which tests are necessary for the magnetic measurements? 7M

   b) Explain the Theory of features of Ballistic Galvanometer. 7M

7. Draw the block diagram of an Oscilloscope and explain briefly its major systems. 14M

8. a) Explain the working principle of Digital Tachometer with the help of neat diagram. 7M

   b) Give the advantages and disadvantages of digital instruments over analog instruments. 7M

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Code : 1G251 **R11**

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Electrical Machines-III

(Electrical & Electronics Engineering)

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 50 Hz, 600 rpm, salient pole synchronous generator has a sinusoidal flux density having a maximum value of 1 tesla. The generator has 180 slots wound with 2 layer 3 turn coils. The coil span is 15 slots and phase spread is 60 degrees. The armature diameter is 1.25m and core length 0.45m. find
   (a) peak value of emf per conductor
   (b) peak value of emf per coil
   (c) rms phase and line voltage, if the machine is star connected. 14M

2. a) Explain the effect of armature reaction on the operation of synchronous generator 7M
   b) Discuss the experimental procedure to determine the synchronous impedance of generator 7M

3. a) Define voltage regulation and mention list of methods to find regulation of alternator 4M
   b) Describe the procedural steps to find regulation of an alternator using Z.P.F.method 10M

4. a) Discuss the operation of synchronization of an alternator with an infinite bus 8M
   b) Two generators rated 420 Mw and 580MW are operating in parallel. The drop characteristics of their governors are 3% and 4% respectively from no-load to full-load. If they are operating at 60 HZ at no-load, how will they share 1000MW load and what will be the system frequency? 6M

5. a) Explain how the armature current and power factor varies with the field current of synchronous motor 8M
   b) A 2300V, 3 phase star connected synchronous motor has a synchronous reactance of 10 ohms/ phase. When the motor delivers 255hp the efficiency is 90% (exclusive of field loss). The power angle is 20°. Calculate (a) E per phase (b) Current and (c) pf. Neglect resistance. 6M

6. Discuss construction and principle of operation of single phase induction motors on the basis of double revolving field theory 14M

7. a) What is universal motor? Draw its phasor diagram and discuss its operation. 8M
   b) A universal motor has an inductance of 0.5H and resistance of 30 ohms. When loaded and connected to 250V dc supply, it takes 0.8A and runs at 2000 rpm. Find the speed and power factor when its operating on 250V, 50Hz, ac supply and it drawing the same current. 6M

8. a) What is a two phase servo motor? Where it is used' Show its connection diagram. Draw its torque speed curve. 7M
   b) Draw a diagram showing the construction of a stepper motor and discuss its operation briefly. 7M

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Code : 1GC52

R11

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Environmental Science

(Electrical & Electronics Engineering)

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)	What is mean by environmental studies? Explain its scope	7M
	b)	What is mean by environmental crisis? Explain.	7M
2.	a)	Write note on renewable and non-renewable energy sources	6M
	b)	Explain the advantages and disadvantages of dam buildings	8M
3.	a)	What are the adverse effects of pesticides?	7M
	b)	Discuss the uses of land and its resources.	7M
4.	a)	What is indoor air pollution? Explain.	6M
	b)	Write a brief account of solid waste management.	8M
5.	a)	Define ecosystem. Explain different components of an ecosystem.	8M
	b)	Discuss the structure and functions of forest ecosystem.	6M
6.	a)	What is mean by biodiversity? Explain genetic and species diversity.	8M
	b)	What are the major threats to biodiversity? Explain.	6M
7.	a)	What is "sustainable development"? Explain.	7M
	b)	What are the causes for acid rain? Explain with examples	7M
8.	a)	Write a note on population explosion and consequences.	7M
	b)	Write a note on the family welfare programme in India.	7M

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Code : 1G356

R-11

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Linear and Digital Integrated Circuits Applicaitons

(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 the internal diagram of an op-amp and explain the operation of each block.	8M
	b)	Explain any one the frequency compensation technique in connection with op-amp.	6M
2.	a)	Draw and explain the integrator circuit using op-amp.	7M
	b)	Explain the working of square wave generator using op-amp.	7M
3.	a)	Explain the operation of astable multi vibrator using 555 timer.	6M
	b)	Explain the following applications of PLL i) Frequency multiplier and ii) AM detection	8M
4.	a)	Explain R-2R ladder type DAC.	7M
	b)	Explain the basic principle of successive approximation type ADC.	7M
5.	a)	Construct and explain CMOS inverter circuit.	6M
	b)	List and explain the electrical behavior in CMOS.	8M
6.	a)	Construct 2 input NOR gate and explain with the help of function table.	6M
	b)	Comparison of logic families	8M
7.	a)	Design 8- to–3 priority encoder and explain with the help of function table.	7M
	b)	Design a half adder circuit which adds two 1 bit operands.	7M
8.	a)	Construct D flip flop using JK flip flops and verify its function table.	7M
	b)	Design a counter which counts 0000 to 1001.	7M

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Code : 1G253

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Power Electronics

(Electrical & Electronics Engineering)

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.		Draw and explain the dynamic turn on and turn off characteristics of SCR.	14M
2.	a)	Explain the SCR operation using two transistor analogy.	8M
	b)	When do the SCRs need to operate in series and parallel? Explain briefly.	6M
3.	a)	Explain the design procedure of a snubber circuit.	10M
	b)	Draw the detailed circuit diagram showing all protection equipment used for SCR.	4M
4.	a)	Draw the circuit diagram and wave forms of output voltage and load current of a 1 φ half-wave controlled rectifier for RL load. Derive the equations for average and RMS output voltage.	8M
	b)	A 1 φ half controlled bridge rectifier circuit is fed from 230V, 50HZ, 1 φ ac supply. Find the average and RMS values of output voltage for a firing angle of 60^0.	6M
5.	a)	Draw the circuit diagram of 1 φ dual converter and explain its working for both modes of operation.	8M
	b)	Draw the output voltage waveforms for a 3 φ semi-converter for firing angles of 30^0 and 90^0.	6M
6.	a)	Explain the working of 1 φ cyclo converter using a centre tapped transformer.	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)	How does a step up chopper work? Explain	7M
	b)	Explain the working of Morgan's chopper with necessary circuit and waveforms.	7M
8.	a)	Draw and Explain the parallel inverter and discuss its modes of operation.	7M
	b)	Explain the various pulse width modulation techniques with relevant waveforms.	7M

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Code : 1G252

R-11

III B.Tech. I Semester Regular Examinations Nov/Dec 2014

Transimission 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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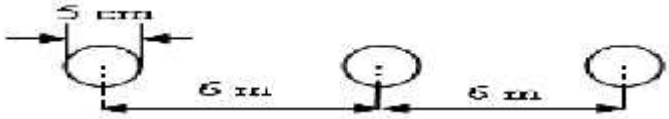
1. a) Derive the expression for the inductance of a 3- ø double circuit flat vertical spacing configuration 7M

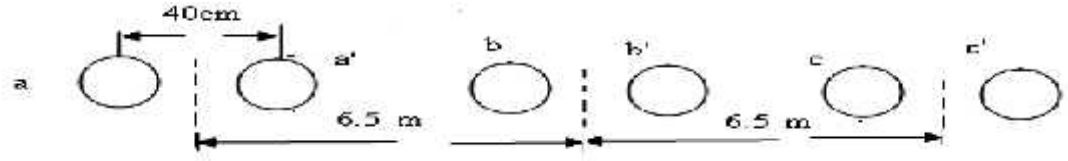
   b) Determine the inductance per km per phase of a single circuit 20 kV line of given configuration as shown in fig. The conductors are transposed and have a diameter of 5 cm.



   7M

2. a) Derive the expression for the capacitance of a 3-Φ un-symmetrically spaced transmission line? 7M

   b) Determine the capacitance and charging current per km of a single circuit 220 kV line using two bundle conductors per phase as shown in the figure. The diameter of each conductor is 4.5 cm



   7M

3. a) 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. 7M

   b) A short 3-Φ transmission line with an impedance of (6+j8)Ω per phase has sending & receiving end voltages of 120KV and 110KV respectively for some receiving end load at a p.f of 0.9 lagging. Determine i) Power Output ii) Sending end power factor 7M

4. Starting from the fundamentals determine the equivalent-T network and equivalent-π network parameters of a long transmission line. 14M

5. a) How can the analysis of a wave travelling on a line terminated by an inductance be carried out? 7M

   b) A surge of 100 KV traveling in a line of natural impedance 600 Ω arrives at a junction with two lines of impedance 800 Ω and 200 Ω respectively. Find the surge voltage and currents transmitted into each branch line. 7M

6. a) Explain the construction and operation of suspension type insulators. 7M

   b) A string of suspension insulator consisting of three units. The capacitance between each link pin and Earth is 1/6th of the self capacitance of each unit. If the maximum voltage per unit is not to exceed 35 KV, determine the maximum voltage that the string can withstand. Also calculate the string efficiency. 7M

7. a) Explain the factors that reduce the corona loss. 7M

   b) Write about the applications of stringing charts. 7M

8. What is the necessity of grading of cables? Explain briefly the various grading methods of cables. 14M

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