Hall Ticket Number :										

R-11 / R-13

Code: 1G254

III B.Tech. I Semester Supplementary Examinations May 2018

Electrical and Electronic Measurements

(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) Compare attraction and repulsion type of M.I. instruments in any eight aspects. 7M
   b) The inductance of a M.I instrument is given by: $L = (10 + 5^{-} - ^{-2})$«H where θ is the deflection in radians from zero position. The spring constant is 12x10^{-6} N-m/rad. Calculate the deflection for a current of 5A. 7M

2. a) Explain the effect of secondary burden on the ratio and phase angle errors of a current transformer. 5M
   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. 9M

3. a) Derive the torque equation of dynamometer wattmeter. 6M
   b) Explain the function of different parts of a single phase energy meter. 8M

4. a) With neat diagram explain Compton's DC potentiometer. 10M
   b) Write a note on applications of AC potentiometer. 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. Prove that the change in value of flux is directly proportional to the change in the deflection in case of flux meter. 14M

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

8. a) Write brief notes on successive approximation type digital voltmeter. 6M
   b) What is digital tachometer explain with neat diagram. 8M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G356

III B.Tech. I Semester Supplementary Examinations May 2018

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)	Draw and explain about Op Amp block diagram	8M
	b)	Mention DC and AC characteristics of OP Amp	6M
2.		Discuss the following	
		a) Precision rectifiers	7M
		b) Square wave generators	7M
3.		Explain with circuit diagram about 555 timer as schmitt trigger	14M
4.		Explain R-2R ladder DAC and Weighted resistor DAC	14M
5.		Draw and explain 2 Input CMOS NAND gate and EX-OR gate with functional tables	14M
6.	a)	Give the detailed comparison of logic families	8M
	b)	Discuss TTL logic families	6M
7.		With neat diagram explain parity circuits and 4 Bit ripple adder	14M
8.	a)	Explain about race around condition and how it can be reduced	6M
	b)	With neat diagrams explain the conversion of JK FF to T FF	8M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G253

III B.Tech. I Semester Supplementary Examinations May 2018

Power Electronics

(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 characteristics of BJT and what is secondary breakdown	7M
	b)	Explain turn on methods of SCR	7M
2.	a)	With the help of neat diagram, explain the two transistor analogy of an SCR. Also discuss the triggering conditions of SCR	10M
	b)	What do you understand by string efficiency? What is its significance	4M
3.	a)	Explain how metal oxide varistors and cathode short improves the dv/dt rating	7M
	b)	Calculate the required parameters for a snubber circuit to provide reliable dv/dt protection to a SCR used in the single phase fully controlled bridge. The SCR has a maximum dv/dt capability of 40v/μs.The input line to line voltage has apeak value of 325V and the source inductance is 0.1mH.	7M
4.	a)	Explain the operation of single-phase half controlled bridge converter with inductive load with associate waveforms. Derive the expression for average output voltage and rms output voltage.	10M
	b)	Explain the effect of freewheeling diode in details. Also justify the statement freewheeling diode improves the power factor of the system.	4M
5.	a)	Explain the operation of three–phase fully controlled bridge converter with resistive load. Describe the operation with associated waveform in discontinuous conduction mode	7M
	b)	Explain the operation of dual converter in circulating current mode.	7M
6.	a)	A single phase full wave controller has an input voltage of 120V (RMS) and a load resistance of 6 ohm. The firing angle of thyristor is 90^0.Find i) RMS output voltage ii) input power factor iii) output power	7M
	b)	Describe the basic principle of working of single phase to single-phase cycloconverter for continuous mode of operation.	7M
7.	a)	With the circuit diagram and output waveforms explain the working of Morgan chopper	10M
	b)	Explain basic operation of step down chopper.	4M
8.	a)	Explain sinusoidal pulse width modulation as used in PWM inverters. Write the important features of it.	7M
	b)	Explain the operation of a single phase full bridge inverter for RL loads with the help of neat circuit diagram and necessary waveforms.	7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G252

III B.Tech. I Semester Supplementary Examinations May 2018

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) Discuss the concept of geometric mean distance. How is this concept used to find the inductance of composite conductor line 7M

   b) Calculate the inductance per phase of a three-phase double circuit line if the conductors are spaced at the vertices of a hexagon of side 2 m each. The diameter of each conductor is 2.0 cm. 7M

2. a) A 3-phase, 50 Hz, 33 kV overhead transmission line has its conductors arranged at the corners of an equilateral triangle of 2.5m sides and the diameter of each conductor is 1.2 cm. Determine the inductance and capacitance per phase, if the length of line is 75 km. And also calculate the charging current. 7M

   b) Explain Skin effect and proximity effect on transmission lines. 7M

3. a) Derive the expressions for the ABCD constants for the nominal-π circuit circuit of a medium transmission line. 6M

   b) A 50 Hz three phase transmission line is 250 km long. It has a total series impedance of (30+j100) ohms and a shunt admittance of 914×10^{-6} mhos. It delivers 50 MW 220 kV with 0.9 power factor lagging. Find the (i) sending end voltage, (ii) voltage regulation and (iii) transmission efficiency by nominal-T method. 8M

4. a) Starting from the first principles, deduce expressions for ABCD constants of a long line in terms of its parameters. 7M

   b) Explain the surge impedance loading of transmission line**.** 7M

5. a) Develop an equivalent circuit at the transition points of transmission lines for analyzing the behavior of travelling waves. 7M

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

6. a) A three phase overhead line is being supported by tree discs suspension insulators, the potential across the first and second insulators are 7 and 10 kV respectively. Calculate (i) the line voltage, (ii) the ratio of capacitance between pin and earth to self-capacitance of each unit, (iii) the string efficiency. 7M

   b) Explain the methods used for improving the voltage distribution along the string of insulators in overhead lines. 7M

7. a) What are the advantages and disadvantages of corona and Why is it different in different weather conditions. 6M

   b) Calculate the minimum sag permissible for a 160 m span, 1.0 cm diameter copper conductor allowing a maximum tensile stress of 2000 kg/cm^2. Assume a horizontal wind pressure of 4 kg/cm^2 of projected area. Take the specific gravity of copper as 8.9 gm/cm^3. 8M

8. a) Derive a formula for capacitance of a single core belted cable. 7M

   b) A 66 kV concentric cable with two inter sheaths has a core diameter of 2.3 cm dielectric material 3.5 mm thick constitutes three zones of insulation. Determine the maximum stress in each of the three layers, if 22 kV is maintained across each of the inner two layers. 7M

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