Hall Ticket Number :										

R-11 / R-13

Code: 1G254

III B.Tech. I Semester Supplementary Examinations May 2017

Electrical and Electronics Measurements

(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) How the controlling torque is produced? Explain with neat sketches the different methods of producing controlling torque indicating their merits and demerits. 10M
   b) Compare PMMC and MI type electrical measuring instruments. 4M

2. a) Explain the turns ratio and phase angle errors are calculated in potential transformer with the help of phasor diagram. 10M
   b) Justify deflection of the instrument is a measure of phase angle of the circuit in a single phase electro dynamo meter type power factor meter. 4M

3. a) Explain the principle of operation of single phase dynamo meter type wattmeter with the help of neat sketch. 10M
   b) Derive the driving torque and braking torque of a single phase Energy meter 4M

4. a) Explain the principle of operation of polar type AC potentiometer 10M
   b) What are the applications of DC potentiometers? 4M

5. a) Explain the measurement of medium resistance with the help of a suitable bridge. 7M
   b) Show the Maxwell's inductance bridge along with phasor diagram and derive the expression to calculate the self inductance and resistance of an inductor. 7M

6. a) Draw the connection diagram for method of reversals to determine B-H loop 10M
   b) Derive the flux density equation of flux meter for a ring specimen. 4M

7. a) Draw and explain the operation of CRO. 10M
   b) Explain the Lessajous patterns of CRO. 4M

8. a) Explain the Ramp type digital voltmeter with the help of voltage to time conversion wave form and suitable block diagram. 7M
   b) With the help of neat sketch describe the functioning of digital frequency meter. 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G251

III B.Tech. I Semester Supplementary Examinations May 2017

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) Derive an expression for EMF equation of a synchronous machine from the first principles? 8M
   b) Compare salient and non-salient pole synchronous machines? 6M

2. a) What is armature reaction? Explain the effect of armature reaction on the terminal voltage of an alternator at (i) unity power factor load (ii) zero leading power factor load. Draw the relevant phasor diagrams? 8M
   b) Enumerate various methods used for minimizing harmonics in turbo alternators? 6M

3. a) Explain synchronous method of determining regulation of an alternator? 8M
   b) Why synchronous method of determining regulation of an alternator leads to a pessimistic value for lagging power factor load? 6M

4. a) Derive an expression for power developed by a synchronous machine as a function of load angle? 6M
   b) A synchronous generator having a synchronous reactance of 1 p.u. is connected to infinite busbars of 1 p.u. voltage through two parallel lines each of 0.5 p.u. reactance.
   Calculate the generator excitation, terminal voltage and power output when it delivers rate current (1.o p.u.) at unity power factor at its terminals. 8M

5. a) Explain the effects of varying excitation on armature current and power factor in a synchronous motor? Draw 'V' curves? 8M
   b) What are the causes for hunting in an alternator operating in parallel with other machines? What are it's bad effects and how they can be minimized? 6M

6. a) Explain why a single phase induction motor is not self starting and discuss its operation based on double field revolving theory. 8M
   b) State the reasons for the inferior performance of single phase induction motors as compared to three phase induction motors. 6M

7. a) Why compensating winding and interpole winding are used for operating a universal motor? 6M
   b) Explain the principle of operation of a permanent magnet fractional horse power synchronous motor. How can the motor be made self starting? 8M

8. a) Explain the construction, working and applications of a stepper motor? 8M
   b) Why AC servo motors are preferred over DC servo motors for small and sensitive servo mechanism 6M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G356

III B.Tech. I Semester Supplementary Examinations May 2017

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) Discuss in detail about Op-Amp characteristics 6M
   b) Write short notes on the following
      (i) Input and output offset voltages and currents
      (ii) Slew rate , CMRR, PSRR 8M

2. Mention the applications of Op Amps and explain the working of Op amp as multivibrator. 14M

3. Write short notes on
   a) Applications of PLL 7M
   b) AM, FM, and FSK demodulators 7M

4. Explain with neat sketch about successive approximation ADC 14M

5. Discuss in detail about dynamic electrical behavior of CMOS 14M

6. a) Explain about CMOS / TTL interfacing 8M
   b) Explain with neat circuit diagram about ECL 6M

7. Discuss the following 7M
   a) Decoder with an example 7M
   b) De Multiplexer with an example

8. With neat diagram explain about decade counter 14M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G253

III B.Tech. I Semester Supplementary Examinations May 2017

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 operation and characteristics of MOSFET. 7M
   b) Explain the different TURN- ON methods of SCR. 7M

2. a) Explain Two transistor analogy of SCR with neat sketch. 7M
   b) A thyristor is made up of a number of SCRs connected in series and parallel. The string has voltage and current ratings of 12KV and 5KA respectively. The voltage and current ratings of available SCRs are 1900Vand 1200A respectively. For a string efficiency of 95%, Calculate the number of series and parallel connected SCRs. 7M

3. a) Design the Snubber circuit to protect a SCR. 7M
   b) Explain what are the methods used to protect an SCR from di/dt and over current. 7M

4. a) Explain the operation of Single Phase fully controlled bridge type rectifier with R- load and derive for average output voltage. 7M
   b) Describe the operation of a single phase two pulse midpoint converter with RL load with relevant waveforms. 7M

5. a) Explain the operation of 3-Φ fully controlled six pulse bridge type rectifier with associated waveforms. 9M
   b) What is necessity of dual converters? Discuss. 5M

6. a) With neat sketch explain Single phase AC voltage controller with two SCRs in anti parallel for R load. 7M
   b) Draw and explain about Single Phase bridge type step- down Cyclo converter for $f_o = 1/4\ f_s$. 7M

7. a) What is meant by step-down chopper? Explain its operation with neat waveforms. 7M
   b) Describe Jone's Chopper with associated waveforms. 7M

8. a) Explain the operation of basic Series inverter with neat sketch & Output waveforms. 7M
   b) Describe anyone PWM technique used in inverter in detail. 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G252

III B.Tech. I Semester Supplementary Examinations May 2017

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) Explain the concepts of Self GMD and Mutual GMD in overhead transmission line. 8M
   b) A single phase transmission line has two parallel conductors 3 m apart, the radius of each conductor being 1 com. Calculate the loop inductance per km length of the line if the material of the conductor is (i) copper (ii) steel with relative permeability of 100. 6M
2. a) Derive an expression for the capacitance of a single phase overhead transmission line 8M
   b) Calculate the capacitance of a 100 km long 3-phase, 50 Hz overhead transmission line consisting of three conductors, each of diameter 2 cm and spaced 3 m at the corners of an equilateral triangle. 6M
3. a) Deduce an expression for voltage regulation and transmission efficiency for medium transmission line using nominal T method 6M
   b) A 3-phase, 50 Hz, 100 km transmission line has the following constants: Resistance per phase per km = 01 ohms, Reactance per phase per km = 10^{-5} siemen. If the line supplies a load of 30 MW at 0.9 p.f. lagging at 66 kV at the receiving end, calculate by using nominal ∏ method (i) Sending end current (ii) Sending end voltage and (iii) Voltage regulation 8M
4. a) Derive the expressions for sending end voltage and current for a long transmission line. 8M
   b) Calculate A,B,C and D constants of a 3-phase, 50 Hz transmission line 140 km long having the following distributed parameters: R = 0.14 ohm per km; L = 1.20 x 10^{-3} H per km; C = 9 x 10^{-9} F per km; G = 0 6M
5. a) Explain the phenomenon of travelling wave in the transmission lines with illustrations. 8M
   b) Describe the effects of transients in the open circuit and short circuit transmission line conditions. 6M
6. a) Explain how the electrical breakdown can occur in an insulator. 6M
   b) A string of 4 insulators has a self-capacitance equal to 10 times the pin to earth capacitance. Find (i) the voltage distribution across various units expressed as percentage of total voltage across the string and (ii) String efficiency 8M
7. a) Explain the following terms with reference to Corona.
      (i) Critical disruptive voltage 3M
      (ii) Visual critical voltage 3M
      (iii) Power loss due to Corona 2M
   b) Derive the expression for Sag in the overhead lines when the supports are at unequal levels. 6M
8. a) What are the most general criteria for the classification of Cables? Draw the sketch of a Single-core low tension Cable and label the various parts. 6M
   b) Explain the following methods of Cable Grading.
      (i) Capacitance Grading 4M
      (ii) Intersheath Grading 4M

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