Hall Ticket Number :										

R-11 / R-13

Code: 1G251

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Electrical Machines-III

(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) Derive the equations for distribution factor, pitch factor in an alternator. 8M
   b) An 8- pole, 3-ø, 60 degres spread, double layer winding has 72 slots and 72 coils. The coils are short pitched by two slots. Calculate the winding factor for the Fundamental and third harmonic. 6M

2. a) Discuss the factors affecting the terminal voltage of an alternator. 6M
   b) What is synchronous impedance? How do you calculate synchronous impedance experimentally? 8M

3. a) Discuss the method of finding Regulation by using Z.P.F. Method with relevant diagrams. 7M
   b) Explain how X d and X q are determined experimentally. 7M

4. a) Explain the advantages of Parallel operation. 5M
   b) A 5000KVA, 10KV, 1500rpm, 50Hz alternator runs in parallel with other machines. Its synchronous reactance is 20%.Find the synchronizing power per unit mechanical angle of the phase displacement For
      (i) No load and (ii) Full load at 0.8 p.f (lag).
      Also calculate the synchronizing torque if the mechanical displacement is 0.5^{o}. 9M

5. a) Explain the starting methods of a synchronous motor. 6M
   b) Describe the principle of operations of a three phase synchronous motor with neat sketches. 8M

6. a) Explain the working principle and operation of single phase induction motor 8M
   b) Discuss about double revolving field theory. 6M

7. a) Discuss the principle of operation of Universal motor with merits and demerits. 9M
   b) Distinguish between Permanent magnet motors and reluctance motors. 5M

8 a) Draw the constructional diagram of Stepper motor and explain. 8M
   b) Distinguish between AC servo motor and DC servo motor. 6M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G254

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Electrical and Electronics 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)	Explain the importance of damping in indicating instruments.	6M
	b)	Explain the operation of Electrodynamometer type instrument with a neat sketch.	8M
2.	a)	Explain errors associated with current transformer in detail	6M
	b)	How can you test a current transformer? Explain any one method to test the current transformer.	8M
3.	a)	Explain the operation of two element energy meter with a neat sketch	10M
	b)	Explain a method to compensate for inductance of pressure coil	4M
4.	a)	Explain the procedure of standardization of potentiometers	6M
	b)	Describe the principle of operation of Gall-Tinsley A.C, Potentiometer with a neat sketch.	8M
5.	a)	Explain why Maxwell's inductance-capacitance is useful for measurement of inductance of coils having storage factors between 1 and 10.	6M
	b)	How to measure insulation resistance using loss of charge method.	8M
6.	a)	Explain a method to measure flux density in rig specimens.	6M
	b)	How can you test iron losses in magnetic testing circuits. Explain in detail	8M
7.	a)	Explain the electrostatic deflection phenomenon in CRO.	8M
	b)	What are lissajious patterns and how they can be used to measure phase and frequency?	6M
8.	a)	Explain the working of digital tachometer with a neat diagram.	8M
	b)	Write a short notes on digital frequency meters.	6M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G253

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

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) Draw and Explain the output characteristics of n-channel MOSFET 7M

   b) Describe the latching and holding current as applicable to an SCR with the help of its static V-I characteristics 7M

2. a) Explain the necessity of static equalizing circuit for series connected SCR's and determine the value of R connected in parallel. 7M

   b) Explain in detail the voltage ratings of SCR 7M

3. a) Explain various cooling methods for power devices.Compare liquid cooling and vapour phase cooling 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 60v/μs.The input line to line voltage has a peak value of 425V and the source inductance is 0.2mH. 7M

4. a) Describe the operation of single phase,two pulse,mid point converter with relevant voltage and current waveforms.Discuss how each SCR is subjected to a reverse voltage equal to double the supply voltage in case turns ratio from primary to secondary is unit 10M

   b) A single phase fully controlled bridge rectifier is given 230V,50Hz supply.The firing angle is 45^0 and the load is highly inductive.Dtermine i) Average output voltage ii) Input power factor. 4M

5. a) Explain the operation of three pulse converter with RL load and draw the corresponding waveforms neatly 7M

   b) Explain the effect of source inductance on the output voltage of three phase fully controlled rectifier and derive the formula for how much voltage is reduced. 7M

6. a) Find the RMS and Average current flowing through the heater (R-Load) having 1kw,220V rated values connected to ac voltage controller with input voltage of 220v. 7M

   b) Explain the meaning of extinction angle as applied to single phase controllers supplying inductive load with the help of waveforms 7M

7. a) With the circuit diagram and output waveforms explain the working of jones chopper 10M

   b) Explain current limit control and time ratio control strategies used for chopper 4M

8. a) Draw and explain the simple SCR series inverter and draw the waveforms. State the limitations of this series inverter. 7M

   b) State various performance parameters use for inverters 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G252

III B.Tech. I Semester Supplementary Examinations Nov/Dec 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) Derive the expression for inductance of a 3-phase overhead transmission line when the conductors are unsymmetrical spacing. 7M

   b) Two conductors of a single phase line, each of 1cm diameter, are arranged in a vertical plane with one conductor mounted 1m above the other. A second identical line is mounted at the same height as the first and spaced horizontally 0.25m apart from it. The two upper and the two lower conductors are connected in parallel. Determine the inductance per km of the resulting double circuit line. 7M

2. a) Derive an expression for the capacitance per km of a three phase line considering the effect of ground. 7M

   b) A three-phase overhead transmission line has its conductors arranged at the corners of an equilateral triangle of 2m side. Calculate the capacitance of each line conductor per km. Given that the diameter of the conductor is 1.25 cm. 7M

3. a) Derive the expression for A, B, C, D parameters of nominal-T medium length transmission line. 7M

   b) A three-phase, 50Hz, transmission line100km long and delivers a load of 20MW at 0.9 p.f lagging and 110KV.the resistance and reactance of the line per phase per km are 0.2 Ω and 0.4 Ω respectively while capacitance admittance is $2.5X10^{-6}$ mho/km/ph. Calculate (i) the current and the voltage at the sending end (ii)efficiency of transmission line by using nominal-T method. 7M

4. a) Explain the surge impedance and surge impedance loading? 7M

   b) A single circuit 50 HZ, 3-Phase transmission line has the following parameters per km:R= 0.2 ohm, L= 1.3 mH and C=0.01 μF. The voltage at the receiving end is 132kV. If the line is open at the receiving end , find the RMS value and phase angle of the following:

      (i)The incident voltage to neutral at the receiving end (reference)

      (ii)The reflected voltage to neutral at the receiving end 7M

5. a) Prove that the travelling wave moves with a velocity of light on the overhead line. 7M

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

6. a) Discuss the methods for improving string efficiency of over head line insulators. 7M

   b) In a three phase overhead system, each line is suspended by a string of three insulators. The voltage across top unit and middle unit are 10kV and 11kV respectively. Calculate the ratio of shunt capacitance to self capacitance, Line voltage and String efficiency. 7M

7. a) State and explain the factors that affect the corona loss? 7M

   b) An overhead line has the fallowing data: span length 185 m, difference in levels of supports 6.5 m, conductor diameter 1.82 cm, weight per unit length of conductor 1.5 kg/m, wind pressure 39 kg/m^2 of projected area. Maximum tensile strength of the conductor is 4250 kg/cm^2, safety factor is 5. Calculate the length of the lower support. 7M

8. a) Explain in detail the construction of cables? 7M

   b) A single-core 66 kV cable working on three-phase system has a conductor diameter of 2 cm and a sheath of inside diameter 5.5 cm. If the two intersheaths are introduced in such a way that the variation of stress is in between the same maximum and minimum in the three layers. Determine the (i) Positions of intersheath, (ii) Voltage on the intersheath, (iii) Maximum and Minimum stresses 7M

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