FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Main) Examination, December 2013

Subject: Electrical Technology

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Draw the circuit of series generator, shunt generator and compound generator. Write the equation for the torque developed in DC motor. Write the relationship for line and phase quantities for both star and delta connected. Define voltage regulation of on alternator. Draw the phase diagram for transformer on NO LOAD. Explain the importance of OC and SC tests for transformer. An 8-pole 50 Hz, 3-phase induction motor has a rotor Emf frequency of 2H ₃ . Calculate slip and speed. Explain why single phase induction motors are not self starting. Advantage and disadvantage of hydro electric power plant. Define regulation and efficiency of a transmission line.	 (3) (2) (3) (2) (3) (3) (2) (3) (2) (3) (2)
	PART – B (50 Marks)	
11.(a) (b)	Explain various methods of speed control of a DC shunt motor. A 30 kW, 300 V, DC shunt generator has armature and field resistance of 0.05Ω and 100 Ω respectively. Calculate the total power developed by the armature when it delivers full load output.	(5) (5)
12.(a) (b)	Prove the power measurement by two-wattmeter method. Determine voltage regulation by the synchronous impedance method.	(5) (5)
13.(a) (b)	Explain the advantage and disadvantages of auto-transformer. A 10 kVA, 200/400 V, 50 Hz, single phase transformer has the following test result: OC test – 200 V, 1.3A, 120 W on LV side	(4)
	SC test – 22 V, 30A, 200 W on HV side.	
	Cal. (i) Magnetising and core loss component at 50 Hz and rated voltage.	
	(ii) Magnetising Branch Impedance.	
	(iii) Regulation at full load at 0.8 pf leading.	(6)
14.(a) (b)	Describe star/delta starter of a 3ϕ induction motor. Explain the operation of a capacitor start induction motor.	(5) (5)
15.	Explain with neat diagram operation and construction of steam power plant.	(10)
16.(a) (b)	Explain and draw characteristic of DC generator and DC motor. Derive the torque-slip equation for a 3ϕ induction motor and also the equation for slip at which maximum torque occurs	(5) (5)
		(3)
17.(a) (b)	3 Phase, 4 pole, star connected alternator has smooth cyclindrical type rotor, the effective resistance and synchronous reactance per phase are 0.15Ω and 2.5Ω . Calculate voltage regulation when delivering250 A at 6.6 KV and at 0.6 pf leading. Block schematic of power system.	(6) (4)