USN: _____

BASIC ELECTRICAL ENGINEERING (18ELE13)

B.E, I SEMESTER   **TEST-II (NOV-2019)**

Time: 1Hr 30 Min.   **Max. Marks: 50.**

Answer FIVE full questions with the given internal choice.

Q. No	Question	Marks	L1-L6	CO
1.	a. Explain the working principle of transformer and list the applications of transformer.	05	L2	CO3
	b. A 3 phase star connected supply with a phase voltage of 230V is supplying a balanced delta load. The load draws 15kW at 0.8pf lagging. Find the line currents and the current in each phase of the load. What is load impedance per phase.	05	L3	CO2
OR				
2.	a. Derive an EMF equation of transformer with usual notations	06	L2	CO3
	b. The three arms of a three-phase load each comprise an inductor of resistance 25ohm and of inductance 0.15H in series with a 120microfarad capacitor. The supply voltage is 415V, 50Hz.Calculate the line current and total power in watts, when three arms are connected in delta.	04	L3	CO2
3.	a. Calculate the active and reactive components of each phase of star connected 10kV,3 phase alternator supplying 5MW at 0.8pf. If the total current remains the same, when the load pf is raised to 0.9, calculate the new output and its active and reactive components per phase.	06	L3	CO2
	b. Two wattmeter's are connected to measure the input to a 3 phase 20HP,50Hz induction motor which works at a full load efficiency of 90% and a power factor of 0.85. Find the readings of the 2 wattmeter's.	04	L3	CO3
OR				
4.	a. The maximum efficiency at full load and unity power factor of a single phase 25kVA ,500/1000V, 50Hz, transformer is 98%. Determine its efficiency at, i)75% load,0.9pf ii 50% load,0.8pf	05	L3	CO3
	b. Explain the importance of Earthing? Also explain the type of earthing in which GI pipe of 38 mm diameter and 2meters length is used.	05	L2	CO2
5.	a. Write a short note on i) Fuse, MCB ii) Precautions taken against electric shock iii)difference between core and shell type transformer iv) 2way control and 3way control of lamp with suitable circuit diagrams and working table.	10	L2	CO3
OR				
6.	a. Derive the voltage and current relations in a balanced 3 phase delta load	05	L2	CO2

	with suitable circuit and phasor diagrams, also derive the power equation.			
	b. Three inductive coils each having resistance of 16ohm and reactance of 12 ohm are connected in star across a 400V, three phase 50Hz supply. Calculate: i)Line voltage ii) phase voltage iii) line current iv) phase current v) power factor vi) power absorbed. Draw the phasor diagram	05	L3	CO2
7.	a. Power is measured in a 3-phase balanced load using two wattmeter's. The line voltage is 400V.The load and its pf is so adjusted that the line current is always 10A.Find the reading of wattmeter's when the pf is i)unity ii)0.866 iii)0.5 iv) zero	06	L3	CO2
	b. A balanced three phase star connected load draws power from 440V supply. The two wattmeter's connected indicate W_1=5kW and W_2=1.2kW. Calculate power, power factor and current in the circuit.	04	L3	CO2
OR				
8.	a. Show that two wattmeter's measure three phase power with suitable circuit diagram and vector diagrams.	10	L2	CO2
9.	a. Explain the generation of three phase voltage with proper waveform and equations.	05	L2	CO2
	b. A transformer is rated at 100kVA.At full load its copper loss is 1200W and its iron loss is 960W.Calculate: i)The efficiency at full load, unity power factor. ii) The load kVA at which maximum efficiency will occur. iii) Maximum efficiency at 0.85pf.	05	L3	CO3
OR				
10.	a. Derive the voltage and current relations in a balanced 3 phase star load with suitable circuit and phasor diagrams, also derive the power equation.	05	L2	CO2
	b. Three equal impedances each of $10 \angle 60°$ ohms are connected in star across 3 phase,400volts 50hz supply. Calculate i) line voltage and phase voltage ii)line current and phase current iii)power factor and active power consumed	05	L3	CO2

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06/11/2019