Sanjay Ghodawat University, Kolhapur

2017-18

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

FY B Tech | **School of Technology** | **Department: FY B Tech**

FYT 107 | **Elements of Electrical Engineering** | **Semester – I**

~~Nov~~ 28 Dec **2017** | **Re – End Semester Examination** | **Time: 3Hrs, Max Marks: 100**

Instructions for Students: 1) Use of non-programmable calculator is allowed.
2) All questions are compulsory.
3) Fig. to the right indicates max. marks for the questions.

			Marks	COs
Q1		Solve the following questions.		
	a)	An iron ring of mean circumference of 60cm has an air gap of 1mm cut in it. It has circular cross section with an area $6cm^2$. It carries a coil with 250 turns wound uniformly. The relative permeability of iron is 300. If the coil carries a current of 1.1A. Find the flux in the air gap. Neglecting magnetic leakage and fringing.	10	CO 1
	b)	State and explain Kirchhoff's law as applied to electrical circuits.	06	CO 1
		OR		
	b)	State similarities & dissimilarities between electric circuit & magnetic circuit	06	CO 1
Q2		Solve **any Two.**		
	a)	Define power factor in AC circuit. Explain power factor improvement by using static capacitor method with suitable phasor diagram.	08	CO 2
	b)	Derive expression for average value of sinusoidal current by analytical method.	08	CO 2
	c)	With neat circuit diagram and phasor diagram discuss R-L-C series circuit.	08	CO 2
Q3		Solve **any Three.**		
	a)	Define & explain the terms: Symmetrical three phase AC supply, Line value and Phase Value	06	CO 3
	b)	Prove that line voltage=$\sqrt{3}$ phase voltage in balanced STAR connected circuit.	06	CO 3
	c)	Prove that line current=$\sqrt{3}$ phase current in balanced DELTA connected circuit.	06	CO 3
	d)	Compare three phase balanced STAR connection and DELTA connection.	06	CO 3
Q4		Solve any **Three.**	Marks	COs
	a)	Define earthing. Explain plate earthing with suitable diagram.	06	CO 4

	b)	Explain single line diagram (SLD) of electrical power system with different power stages.	06	CO 4
	c)	What is the fuse? Explain HRC type of fuse with neat diagram.	06	CO 4
	d)	State causes of electrical accidents. Explain in brief different precautions for electrical safety.	06	CO 4
Q5		Solve **any Two.**		
	a)	State the principle on which transformer works. Compare core type transformer with shell type transformer.	08	CO 5
	b)	What is the condition for maximum efficiency in single phase transformer?	08	CO 5
	c)	A 200V/400V, 50Hz single phase transformer operates on rated supply at no load by taking 1A at 0.2pf. The emf per turn is 2V. Calculate: 1) Maximum flux in the core 2) Primary winding turns 3) Secondary winding turns 4) Iron loss at full load	08	CO 5
Q6		Solve **any Two.**		
	a)	Explain the construction and working of three phase induction motor with neat diagram	10	CO 6
	b)	Explain the concept of slip (s) in three phase induction motor. Drive the expression for frequency of rotor current. (i.e: f'=sf)	06	CO 6
		OR		
	b)	Explain squirrel cage and wound rotor type induction motor with neat diagram.	06	CO 6

*****

35