Question Paper Code: 50481					
B.E./B.Tech./B.A	Electrical	Fourth and Ele ELECT	NATION, NO n Semester ectronics Engir RICAL MACH ations 2013)	neering	ECEMBER 2017
Time : Three Hours				Max	rimum: 100 Marks
	A	Answer A	ALL questions		(13)
		PA	RT – A		(10×2=20 Marks)
1. Define Magnet	ic flux density.				
2. Define Self Ind	uctance.	THE PERSON NAMED IN			
3. List out the me	rits and demer	its of cor	e and shell type	transformer.	
4. How do you red	luce leakage flu	ıx in a tr	ansformer?		
5. State the princ	iple of electrom	echanic	al energy conve	rsion.	
6. Predominant e	nergy storage o			n electromech	nanical energy
7. What is the pu	rpose of yoke in	a D.C. 1	machine?		
8. What is critica	l resistance of a	D.C. Sh	unt generator		
9. What will happ	oen to the speed	l of a D.(C. motor when it	ts flux approa	ches zero ?
	Mention the effects of differential compounding and cumulatively compound on the performance of D.C. compound motor.				

50481 PART - B (5×13=65 Marks) 11. a) For the magnetic circuit shown in Fig. 11 (a), with a core thickness of 5 cm, exciting current of 0.5A wound with 1000 turns coil, find the flux density and flux in each of the outer limbs and the central limbs. Assume relative permeability for iron of the core to be a) infinity b) 4500. (13)Fig. 11 (a) (OR) b) Draw and explain the typical magnetic circuit with air-gap and its equivalent electric circuit. Hence derive the expression for air gap flux. (13) 12. a) Explain the principle of operation of a transformer. Derive its EMF equation. (13) (OR) b) Draw and explain the phasor diagram of transformer when it is operating under (13)13. a) The electromagnetic relay shown in Fig. 13 (a) is excited from a voltage source of $v = \sqrt{2} \; V \; sin \omega t.$ Assuming the reluctance of the magnetic circuit to be constant, find the expression for the average force on the armature, when the armature is held fixed at distance x. Fig. 13 (a)

b) Discuss in detail the production of mechanical force for an attracted armature

(13)

relay excited by an electric source.

50481 -3-14. a) A separately excited generator when running at 1000 r.p.m. supplied 200A at 125 V. What will be the load current when the speed drops to 800 r.p.m. if I_f is unchanged? Given that armature resistance = 0.04Ω and brush drop = 2 V. (13)Derive the necessary equations. (OR) b) Explain in detail about commutation and list out the various methods of improving commutation in detail with a neat sketch. (13)15. a) Draw the neat sketch of 3 point starter and explain its working. (13)(OR) b) Explain the different methods of speed control of dc shunt motor with neat circuit (13)diagrams. PART - C (1×15=15 Marks) 16. a) A 75 KVA transformer has 500 turns primary and 100 turns secondary. The primary and secondary resistances are 0.4Ω and 0.02Ω respectively and the corresponding leakage reactances are $1.5\,\Omega$ and $0.045\,\Omega$ respectively. The supply voltage is 2200V. Calculate a) equivalent impedance referred to the primary circuit and b) the voltage regulation and secondary terminal voltage for full load at power factor of i) 0.8 lagging and ii) 0.8 leading. b) A toroidal core made of mild steel has a mean diameter of 16 cm and a crosssectional area of 3 cm². Calculate a) the m.m.f to produce a flux of 4×10^{-4} Wb and b) the corresponding values of the reluctance of the core and the relative permeability.