Fnrolln	nont l	No:	_ Exam Seat No:		
Ellfolli	nent 1	C. U. SHAH	UNIVERSITY amination-2020		
Subject	t Nam	ne: Electrical Machine – I			
Subject Code: 4TE03EMC1		e: 4TE03EMC1	Branch: B.Tech (Electrical)		
Semest	er : 3	Date: 05/03/2020	Time: 02:30 To 05:30	Marks :70	
(2) (3)	Use of Instru Draw	of Programmable calculator & a auctions written on main answer were neat diagrams and figures (if notes me suitable data if needed.	•	ibited.	
Q-1		Attempt the following question	ons:	(14)	
	a)	The commercial efficiency of variable losses equal(A) constant (B) Stray (C) iron	a shunt generator is maximum who losses.	en its	
	b)	(D) friction & windage Lap winding is suitable for d.c.generators. (A) High, low (B) Low, high (C) Low, low	orvo	oltage	
	c)	(D) High, highThe critical resistance of the d.(A) Armature(B) Field(C) Load(D) have been seen as a few seen as a few	c. generator is resistance of		
	d)	(D) brushesD.C. shunt motors are used for(A) trains(B)cranes(C)hoists(D)machine tools	driving		
	e)		ed to have maximum efficiency at		



f) In a 3-phase induction motor, the rotor field rotates at synchronous speed

(C) 50% full load (D) no load

with respect to

		(A) stator	
		(B) rotor	
		(C) stator flux	
		(D) none of the above	
	g)		
	8/	(A) copper	
		(B) carbon	
		(C) phosphor bronze	
		(D) aluminum	
	h)	In a dc machine 4 pole lap winding is used. The number of parallel paths	
	/	is?	
		(A) 2	
		(B) 4	
		(C) 1	
		(D) 8	
	i)	Emf generated in conductor is collected by	
	-)	(A) brush	
		(B) brush & ring	
		(C) ring	
		(D) none of above	
	i)	Define the term : voltage regulation	
	•	How may the direction of rotation of a d.c. motor be reversed?	
	l)	Define the term: All day efficiency	
	m)	Explain the function of yoke.	
		Explain the function of commutator.	
Atten	-	four questions from Q-2 to Q-8	
Q-2		Attempt all questions	(14)
	(a)	What is need of starter? Explain the construction and working of three	(07)
		point starter.	
	(b)	Explain in detail armature reaction in dc machines.	(07)
Q-3		Attempt all questions	(14)
	(a)	Explain different types of D.C. generator.	(07)
	(b)	Derive the E.M.F equation for Simplex lap and wave wound generator.	(07)
Q-4		Attempt all questions	(14)
	(a)	Explain the Swinburne test of D.C. Motor.	(07)
	(b)	Derive the EMF equation for single phase transformer with help of	(07)
		sketch.	
Q-5		Attempt all questions	(14)
	(a)	Explain the Need of Parallel operation of Transformer. What are the	(07)
		Conditions of parallel operation of Transformers?	
	(b)	A short-shunt compound generator delivers a load current of 30A at	(07)
		220V, and has armature, series-field and shunt-field resistances of 0.05	
		Ω , 0.30 Ω and 200 Ω respectively. Calculate the induced e.m.f. and the	
		armature current. Allow 1.0 V per brush for contact drop.	



Q-6	Attempt all questions		
	(a)	Explain the operation of transformer on load and no load with vector	(07)
		diagram.	
	(b)	Explain the Condition for Maximum Efficiency of Transformer.	(07)
Q-7		Attempt all questions	
	(a)	A 30kVA, 2400/120 V, 50 Hz transformer has a high voltage winding resistance of 0.1 Ω and a leakage reactance of 0.22 Ω . The low voltage winding resistance is 0.035 Ω and the leakage reactance is 0.012 Ω . Find	(07)
		the equivalent winding resistance, reactance and impedance referred to	
	<i>-</i> .	the (i) high voltage side and (ii) the low voltage side.	
	(b)	Explain the Speed control of D.C. Series Motor.	(07)
Q-8		Attempt all questions	(14)
	(a)	Explain the Production of Rotating field of 3 Phase Supply for Induction	(07)
		Motor.	
	(b)	Define the term "slip" of induction motor. Draw and Explain the torque-	(07)
		slip characteristics of a three phase induction motor.	

