## B.E. (Electrical (Electronics & Power) Engineering) Fifth Semester (C.B.S.) Electrical Machines – II

	ages : e : Thi	2 ee Hours	s *0410*		<b>NRJ/KW/17/4477</b> Max. Marks : 80	
	Note	<ol> <li>Solve Qu</li> <li>Solve Qu&lt;</li></ol>	tions carry marks as indicate testion 1 OR Questions No. testion 3 OR Questions No. testion 5 OR Questions No. testion 7 OR Questions No. testion 9 OR Questions No. testion 11 OR Questions No. tit will be given to neatness suitable data whenever nece your answers whenever nece on programmable calculator	2. 4. 6. 8. 10. 5. 12. and adequate dimensions. essary. cessary with the help of neat	sketches.	
1.	a)	i) Pitch factor.	n the following terms. ii)	Single layer and double la	<b>6</b> yer winding.	
	b)	A 3 phase, 16 pol The flux is distrib and 4 conductors	uted sinusoidally over the p per slot are accommodated	s a resultant air gap flux of 0 oole. The stator has two slots in two layers. The coil span when the machine runs at 37	per pole per phase is 150° electrical	
2	,	T. 71 .1 (* 11 ·	-	DR	3	
2.	a)	Why the field winding is placed on rotor in 3 phase alternator.				
	b)	Compare Hydro–	Generator with turbo genera	ator.	4	
	c)	with 3 slots/pole	/phase and 8 conductors/s	phase of a 10 pole, 3 phase, slot in two layers. The coi 15wb and a 15% third compo	l span is 120°. The	
3.	a)	Why the terminal	voltage of alternator decrea	ases with load increase.	6	
	b)	2 pole, 50Hz turb at the rated speed 800A. At the rate	o alternator, with a field cur , with the same field current	a 3 phase, 6000KVA, 6600V rrent of 125A, the open circu t and rated speed, the short ci rop is 3 percent. Find the reg of 0.8 lagging.	it voltage is 8000V ircuit current is	
4.	a)	Explain potier rea		<b>)R</b> mination of regulation of alt	ernator. <b>7</b>	

	b)	A 3 phase, star connected synchronous generator supplies current of 10A having phase angle of $20^{\circ}$ lagging at 400V. Find the load angle and the components of armature current Id and Iq if Xd = 10 ohm and Xq = 6.5 ohm Assume armature resistances to be negligible.	6						
5.	a)	Explain zero sequence and negative sequence reactances.	6						
	b)	What is short circuit Ratio. Compare the performance of synchronous machine having low short circuit ratio and machine having high short circuit ratio.	7						
	OR								
6.	a)	Explain slip test for determination of Xd and Xq.	7						
	b)	Explain need and necessary condition for parallel operation of alternator.							
7.	a)	Explain the effect of increased load on constant excitation of synchronous motor.	7						
	b)	A 2300V, 3 phase, star connected synchronous motor has a resistance of 0.2 ohm per pha and a synchronous reactance of 2.2 ohm/phase. The motor is operating at 0.5 power facto leading with a line current of 200A. Determine the value of generated emf per phase.							
_		OR	5						
8.	a)	Explain 'V' and Inverted 'V' curves of a synchronous motor.							
	b)	<ul> <li>A 400V, 50Hz, 3φ, 37.3kW, star connected synchronous motor has a full load efficiency of 88%. The synchronous impedance of the motor is (0.2 + j0.6)Ω per phase. If the excitation of the motor is adjusted to give a leading pf of 0.9. Calculate for full load –</li> <li>a) The induced emf.</li> <li>b) The total mechanical power developed.</li> </ul>							
9.	a)	Explain hunting in synchronous machine. How it is reduced.							
	b)	How sub transient reactances are measured in laboratories.	8						
10.	a)	<b>OR</b> Explain the three phase short circuit phenomenon comparing with steady state.							
	b) Draw phasor diagram of salient pole synchronous motor and explain the same Assuming lagging power factor.								
11.			4						
		i) Repulsion motor. ii) Universal motor.							
12.			4						
		i) BLDC motor. ii) Hysteresis motor.							
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