Evaluation

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

	Subject	Code & Name: BTEE	C403 & Electrical Machi	ine-II Semes	ter: IV	
	Max Max	arks: 60	Date: 22-08-2022	Duration	: 3.45 Hr.	
	1. 2. 2. 2. 3. 7. 3. 3. 7. 3. 3. 7. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3.	which the question is bas Ise of non-programmabl	ipulsory. ected answer as per OBE or the sed is mentioned in () in front to le scientific calculators is allowerever necessary and mention	of the question wed.		
					(Level/CO)	Mark
Q. 1		ny Two of the following				
A)			onstruction of a 3-phase induct		Understand	6
B)			ectorially that in a three phased when supplied with three plant		Apply	6
C)			tion of Synchronous machine.		Understand	6
Q.2	Solve Ar	ny Two of the following	y .			
A)	With nea	at sketches give a brief	note on Harmonics in altern	ator and also	Apply	6
	give a re	duction remedies'.				
B)	Memoriz	e the following winding	terminologies			6
	1.	Single layer and doub	le layer winding			
	11.	Full pitch and short pi	itch winding		Remember	
	iii.	Concentrated and dist	ributed winding			
	lagging a	nd at 11 KV (terminal vhronous reactance 0.66	nator supplies a load of 10M voltage). Its resistance is 0.1 of ohm per phase Calculate the	hm per phase	Analysis	6
Q. 3	Solve An	y Two of the following				
A)	What is	voltage regulation in al	ternator? Explain any one me	ethod to find		6
	voltage re	egulation in alternator.			Remember	
	i)	Synchronous impedan	ce method/ EMF Method			
	ii)	ZPF Method				
B)	State the parallel of	necessity of parallel ope peration.	ration of alternators. List the c	onditions for	Understand	6
	A 3 phase	e star connected alternate	or is rated at 1600 KVA, 13,50		Evaluation	6

armature resistance and synchronous reactance are 1.5 ohm and 30ohm re-

spectively per phase. Calculate the percentage regulation for a load of 1280

KW at.0.8 leading power factor

Q.4	Solve Any Two of the following.		
A)	Explain with neat diagram, construction and working of double cage induction motor.	Understand	6
B)	A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50Hz. Calculate i) the speed at which the magnetic field of the stator is rotating the speed of the rotor when the slip is 0.04	Evaluation	6
C)	Explain the tests conducted to draw circle diagram of three phase induction motor. Explain how, max. torque max. power output is obtained from circle diagram	Understand	6
Q. 5	Solve Any Two of the following.		
A)	Draw the circuit diagram of a capacitor start capacitor run single phase induction motor and explain its working.	Understand	6
B)	Illustrate neat sketches and explain why single phase induction motor is not self starting; explain the phenomenon through Double field revolving theory	Apply	6
C)	Demonstrate the principle of operation and application of Permanent magnet motor.	Apply	6

*** End ***

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	Course: B. Tech. Branch :Electrical Subject Code & Name: BTEEC403 Subject: Electrical Machi Max Marks: 60 Date:18/07/2023 Duration: 3 1	ne-II	
	Instructions to the Students: 1. All the questions are compulsory. 2. The level of question/expected answer as per OBE or the Course Outcome which the question is based is mentioned in () in front of the question 3. Use of non-programmable scientific calculators is allowed. 4. Assume suitable data wherever necessary and mention it clearly.	(Level/C	Marks
	4. Alaune Survey and Proceed Accessed	0)	
	The of the following	COI	12
Q. 1	Solve Any Two of the following.	COI	6
A)	Explain the principal operation of 3-phase induction Motor.	COI	6
B)	With neat sketches discuss the construction of synchronous Motor.		(
C)	Discuss a brief note on Construction of 3- phase induction Motor.		12
0.2	Solve Any Two of the following.	-	
A)	Define the following terms	CO2	6
B)	Conductor 2. Coil 3. Turns Explain Full pitch winding and short pitch winding with the help of	CO2	6
C)	Diagram. What is pitch factor or a coil span factor (Kp or Kc)	CO2	6
			12
0.3	Solve Any Two of the following.		
A)	State the necessity of parallel operation of an atternator. List the	CO3	6
B)	condition For parallel operation. Draw the Equivalent circuit and phasor diagram of a synchronous	CO3	6
	generator. A 3-phase, 1500 KVA star connected 50 hz 2300 V alternator has a resistance per phase of 0.12 Ω. A field current of 70 A produces a short circuit current equal to full load current of 376 A in each line. The same field current produces an emf of 700 V on open circuit. Determine the Synchronous reactance and its full load regulation at a 0.8 P.F lagging.	CO3	6
Q.4	Solve Any Two of the following.		12

	and a power runs at synchronous Speed.	CO4	1
A)	Explain why 3-phase Induction motor never runs at synchronous Speed.		
B)	Explain in brief production of rotating magnetic field in 3-phase	CO4	6
C)	 A 746 kw, 3-phase, 50 hz, 6 pole induction motor has a rotor impedance of (0.02+j 0.15) Ω at standstill. Full load torque is obtained at 360rpm. Calculate 1. The ratio of maximum to full load torque. 2. The speed at maximum torque. 3. Rotor resistance to be added to get maximum starting torque. 	CO4	6
			12
Q. 5	Solve Any Two of the following. Explain the phenomenon of Double field revolving theory.	CO5	6
A)	Explain the phenomenon of Double field revolving the system and explain its working.	CO5	6
B)	Draw the circuit diagram of shaded pole motor and explain its working.	CO5	6
C)	Demonstrate the principle of operation and application of Permanent magnet motor.	COS	
	*** End ***		

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	urse: B. Tech. Branch: Electrical Engineering / Electrical Engineering (Electrower) / Electrical & Electronics Engg. / Electrical & Power Electrower & Code: BTEEC403 Electrical Machine- I	Ingineering.	
M:	1x Marks: 60 Date:18/06/2024 Dur	ation: 3 Hr	s.
	Instructions to the Students: 1. All the questions are compulsory. 2. The level of question/expected answer as per OBE or the Course Outcome (Course question is based is mentioned in () in front of the question. 3. Use of non-programmable scientific calculators is allowed. 4. Assume suitable data wherever necessary and mention it clearly.	O) on which	
		(Level/CO)	Ma
. 1	Solve Any Two of the following.		1.
A)	Explain construction and principle of operation of synchronous generator and motor	Remember	6
B)	What is RMF? Find the Direction of RMF by using phasor method.	Understand	6
(C)	Enlist the causes of harmonics and explain How do you reduce the harmonics in EMF generated in alternator?	Understand	6
.2	Solve Any Two of the following.		13
A)	Define the following terms with diagram and Formulas [2M each]	Remember	6
	1. Coil Span Factor 2. Distribution Factor 3. Winding factor		
B)	What is Armature Reaction in Synchronous Machine? explain Armature Reaction at different power factors with Phasor Diagram	Remember	6
C)	A 3-phase, 16-pole synchronous generator has a resultant air gap flux of 0.06 Wb per pole. The flux is distributed sinusoidal over the pole. The stator has 2 slots per pole per phase and 4 conductors per	Evaluate	6

slot are accommodated in two layers. The coil span is 150\0 electrical. Calculate the phase and line induced voltages when the

	machine runs at 375 r.p.m		
. 3	Solve Any Two of the following.		12
A)	Draw the equivalent circuit diagram of synchronous machine and explain each parameter used in circuit.	Understand	6
B)	Briefly discuss on synchronous condenser.	Understand	6
C)	A 1500kVA, star connected, 2300V, 3-phase, salient-pole synchronous generator has reactance $X_d=1.95\ ohm$ and $X_q=1.4\ ohm$ per phase. All losses may be neglected. Find the excitation voltage for operation at rated kVA and power factor of 0.85 lagging	Evaluate	6

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Q.4	Solve Any Two of the following.		-
A)	Compare squirrel cage and slipring Induction motor	Remember	-
B)	Derive the generalized torque equation of three phase induction motor and Obtain the condition for maximum torque under running condition	Create	6
C)		Evaluate	6
Q. 5	Solve Any Two of the following.		12
*)	Explain the construction and working principle of single phase Induction Motor	Understand	6
B)	Explain the double revolving field theory	Understand	
Ø)	Briefly discuss on permanent magnet ac motors.	Remember	6
	*** End ***		