	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Summer Supplementary Examination – 2022** **Course: B. Tech. Branch :Electrical Engineering Semester : III** **Subject Code & Name: BTEEC302, Electrical Machines-I** **Max Marks: 60 Date: 11/1/2023 Duration: 3 Hr.**		
	Instructions to the Students: 1. *All the questions are compulsory.* 2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on 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/CO)	Marks
Q. 1	**Solve Any Two of the following.** *(This is just a sample instruction)*		**12**
A)	Explain construction of single phase transformer with neat diagram.	**1**	**6**
B)	State and explain necessary conditions for parallel operation of two single phase transfomers	**2**	**6**
C)	A 600 kVA, 1-phase transformer has an efficiency of 92 % both at full-load and half-load at unity power factor. Determine its efficiency at 60 % of full-load at 0.8 power factor lagging.	**3**	**6**
Q.2	**Solve Any Two of the following.** *(This is just a sample instruction)*		**12**
A)	Explain three phase to two phase Scott connection of transformers.	**1**	**6**
B)	A 3-ph, delta/star connected 11,000/440 V, 50 Hz transformer takes a line current of 5 amp, when secondary Load of 0.8 Lagging p.f. is connected. Determine each coil current and output of transformer.	**3**	**6**
C)	Write note on three winding transformer.	**2**	**6**
Q. 3	**Solve Any Two of the following.** *(This is just a sample instruction)*		**12**
A)	Deriveemfequationofdc generator.	**4**	**6**
B)	A 4-pole, lap-wound, d.c. shunt generator has a useful flux per pole of 0.07 Wb. The armature winding consists of 220 turns each of 0.004 Ω resistance. Calculate the terminal voltage when running at 900 r.p.m. if the armature current is 50 A.	**3**	**6**
C)	What is armature reaction? Explain effect of armature reaction in dc generators.	**2**	**6**
Q.4	**Solve Any Two of the following.** *(This is just a sample instruction)*		**12**
A)	Explain different characteristics of dc shunt motor with neat diagrams.	**1**	**6**
B)	A 220 V shunt motor has an armature resistance of 0.5 ohm and takes an armature current of 40 A on a certain load. By how much must the main flux be	**5**	**6**

	reduced to raise the speed by 50% if the developed torque is constant ? Neglect saturation and armature reaction.		
C)	Explain Field flux and armature resistance control methods for speed control of dc shunt motor	**2**	**6**
Q. 5	**Solve Any Two of the following.** *(This is just a sample instruction)*		**12**
A)	Explain full step operation of variable reluctance stepper motor with neat diagram	**4**	**6**
B)	Explain construction and working of brushless dc motor.	**2**	**6**
C)	Explain concept of energy and coenergy for linear magnetic field system and derive relevant expressions.	**2**	**6**
	***** End *****		

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