

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE Supplementary Examination – Summer 2022 Course: B. Tech. Branch : Electrical Engineering Semester : VI Subject Code & Name: BTEEC602: Principles Of Electrical Machine Design Max Marks: 60 Date: / /2022 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.		12
A)	Explain factors affecting design of machine in detail.	CO1	
B)	Explain the various limitations in design of machines in detail.	CO1	
C)	Discuss briefly about electrical properties of insulating materials.	CO1	
Q.2	Solve Any Two of the following.		12
A)	Explain design procedure of starter used in dc shunt motor.	CO2	
B)	A 250 V, 1 kW single element electric furnace is to employ a nichrome wire operating at 1000 C. Estimate a suitable diameter and length of wire. Take radiating efficiency = 1, emissivity = 0.9 and resistivity of wire to be 0.424 Ω.m at 1000 C.	CO2	
C)	Explain the Design procedure of Electromagnet.	CO2	
Q. 3	Solve Any Two of the following.		12
A)	Develop a simplex LAP winding diagram for DC machine having 24 armature conductor and 6 pole .Mark the Poles , draw th sequence diagram, indicate the position of brushes.	CO3	
B)	Explain the Following terms: a. Back pitch b. Front Pitch c. Winding Pitch d. Commutator Pitch	CO3	
C)	What is the effect of chording and distributing the winding in slots , in the emf generated.	CO3	

Q.4	Solve Any Two of the following.		12
A)	What are Sources of heat generation in a rotating electrical machine.	CO1	
B)	Write a short note on hydrogen cooling.	CO1	
C)	A 250 V, 1 KW single element resistor is made from 0.2 mm thick nickel chrome strip. The ambient temperature of 30°C. Calculate the length and width of the strip. Assume, emissivity = 0.9 radiating efficiency 0.75, resistivity of nickel chrome 1×10^{-6} ohm m.	CO1	
Q. 5	Solve Any Two of the following.		12
A)	Derive the output equation of three phase transformer.	CO2	
B)	Find the core and window areas required for a 1000 KVA , 6600/400V, 50 Hz , single phase core type transformer. Assume a maximum flux density of 1.25 Wb/m ² . Voltage per turn = 30 V and window space factor = 0.32.	CO2	
C)	Explain the design procedure with flow chart in computer Aided Design.	CO2	
	*** End ***		