

<b>DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE</b> <b>Winter Examination – 2022</b> <b>Course: S. Y. B. Tech.      Branch :Electrical Engineering      Semester :III</b> <b>Subject Code &amp; Name: (BTEEC302) Electrical Machines-I</b> <b>Max Marks: 60      Date: 11-03-2023      Duration: 3 Hr.</b>			
<b>Instructions to the Students:</b> 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
<b>Q. 1</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Explain classification of single phase of transformer in details.		6
B)	Explain in details Transformer is on load and Draw Phasor Diagram of for resistive load.		6
C)	Explain construction and operation of variable frequency transformer with neat diagram.		6
<b>Q.2</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Explain different cooling methods of three phase of transformer.		6
B)	Derive the EMF equation for transformer.		6
C)	A 100 kVA,3-phase, 50 Hz, 3,300/400 V transformer is $\Delta$ - connected on HV side and Y- connected on LV side. The resistance of the HV winding is $3.5 \Omega$ per phase and that of the LV winding $0.02 \Omega$ per phase. Calculate the iron losses of the transformer at normal voltage and frequency if its full-load efficiency be 95.8 % at 0.8 pf lagging.		6
<b>Q. 3</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	What is energy balance and law of electromagnetism in details?		6
B)	Explain the different type of Magnetic system.		6
C)	Explain energy conversion via electrical field?		6
<b>Q.4</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Explain construction and working principal of DC generator with neat diagram.		6
B)	A lap wound DC shunt generator having 80 slots with 10 conductors per slot generates at no load an emf of 400 volt, when running at 1000 r.p.m. at what speed should be rotated to generate a voltage of 220 volt on open circuit.		6

C)	Explain different type of DC motor with neat circuit diagram and equation.		6
Q. 5	Solve Any Two of the following.		12
A)	Derive the equation of torque for DC motor.		6
B)	Justify the need of starters for DC motors with equation.		6
C)	What is stepper motor and explain construction and working of stepper motor with neat diagram.		6
*** End ***			

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