SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
Hanuman Vyayam Prasarak Mandals's
College of Engineering & Technology, Amravati
Course: Electronics and Telecommunication
BE Four year Semester 3rd Summer 2020 Exam Subject: 3XT04
Electric Drives and Measurement
<u>**Assignment for ONLY BACKLOG STUDENTS**</u>

Instructions

1) **Solve ANY TWO Questions**
2) **Each Question Carries 10 marks**

Q I   Solve the Following

1)	Derive the general equation for bridge balance to satisfy the magnitude of impedance and phase angle balance condition in an a.c. bridge	**2 marks**
2)	Draw and explain Electrodynamometer type power factor meter	**2 marks**
3)	Explain the characteristics of DC series motor. Why it should not be started without load. State its applications.	**2 marks**
4)	Explain slip power recovery scheme for speed control of induction motor.	**2 marks**
5)	Explain the three-phase to two-phase conversion using single-phase transformer. State its applications.	**1 marks**
6)	Explain the principle and construction of AC-servomotor	**1 marks**

Q II   Solve the Following

1)	A bridge consists of the following : Arm ab - Consist of choke coil having resistance R_1 and inductance L_1. Arm bc - Non inductive resistance R_3 Arm cd - Capacitor C_4 in series with non inductive resistance R_4 Arm da - Non inductive resistance R_2. When bridge is fed from source of 500 Hz and balance is obtained under following condition $R_2 = R_3 = 10,000\ \Omega$, $R_4 = 81,200\ \Omega$, $C4 = 980$ picofarad. Calculate R_1 and L_1 of the choke coil. The supply is connected between point a and c. The detector is connected between b and d.	**2 marks**
2)	Draw and explain Electrodynamometer type frequency meter	**2 marks**
3)	Explain plugging method of braking of dc motor. What are its disadvantages.	**2 marks**
4)	Derive an expression for running torque of 3 – phase induction motor.	**2 marks**

5)	Explain in detail rectifier transformer.	**1 marks**
6)	Explain AC Tachometer in brief.	**1 marks**

Q III   Solve the Following

1)	Describe and explain with the help of neat sketch; the principle and working of Megger.	**2 marks**
2)	A 3-phase balanced load power was measured by two wattmeter method. If the reading of two wattmeter so connected are 5 kW and 0.5 kW; the latter reading being obtained after reversal of current coil connection. Calculate the power factor of load.	**2 marks**
3)	Explain flux control method for speed control of dc series motor.	**2 marks**
4)	With neat sketch, explain plugging method for 3-phase induction motor	**2 marks**
5)	Explain the scott connection of transformer with phasor diagram.	**1 marks**
6)	Explain principle of operation and application of stepper motor	**1 marks**

Q IV   Solve the Following

1)	The arm of ac Maxwell bridge are arranged as follows : AB is non inductive resistance of 1000 Ω in parallel with a capacitor of capacitance 0.51 µF, BC is an non-inductive resistance of 600 Ω and CD is an inductive impedance and DA is non-inductive resistance of 400 Ω. If the balance is obtained under these conditions, find the value of resistance and inductance of branch CD. Also draw the phasor diagram.	**2 marks**
2)	Describe the method for measurement of reactive power in balance three phase circuits. Draw the phasor diagram.	**2 marks**
3)	A 230 V, DC shunt motor runs at 800 rpm and takes armature current of 50 Amp. Find resistance to be added to field circuit to increase speed to 1000 rpm at an armature curent of 80 Amp. Assume flux is proportional to field current. Consider armature resistance of 0.1 Ω and shunt resistance of 250 Ω.	**2 marks**
4)	Explain with neat sketch V/f speed control method for 3-phase induction motor.	**2 marks**
5)	Explain in detail ferrite core transformer.	**1 marks**
6)	Explain the construction, characteristic and principle of universal motor	**1 marks**