KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2022 Admission
I Semester Final Examination – March 2023

Fmpe.1101 **Electrical Engineering (2+1)** **Marks: 50**
Time: 2 hours

I **Fill in the blanks** **(10x1=10)**

1. The main purpose of performing open circuit test on a transformer is to measure its .....
2. The impedance of a capacitor ..... with increasing frequency.
3. The amplitude of the voltage available in the 50 Hz, 230 V power outlet in your home is .....
4. When load is placed on a three phase induction motor, its slip .....
5. In a star-star system, a line voltage of 220 V produces a phase voltage of .....
6. An ideal DC generator is one that has .....voltage regulation.
7. The direction of rotation of a DC motor may be reversed by reversing the .....
8. In the two wattmeter method of measurement, if one of the wattmeters reads zero, then power factor will be .....
9. In a three phase induction motor, the relative speed of stator flux with respect to ..... is zero.
10. ..... motors are used in traction applications.

II **Write short notes on ANY FIVE of the following** **(5x2=10)**

1. Mention any two advantages of an AC power supply system.
2. State the significance of back emf in a DC motor.
3. What is the use of commutator in a DC Machine?
4. Why an induction motor never runs at its synchronous speed?
5. Write the mathematical relation between line current and phase current in a three phase delta connected system. Mention the relation between its line voltage and phase voltage.
6. What do you understand by voltage regulation of a transformer?
7. Define average and peak value of an AC waveform.

III **Answer ANY FIVE of the following.** **(5x4=20)**

1. In a balanced three-phase circuit, power is measured by two wattmeters, the ratio of two wattmeter readings is 2 : 1. Determine the power factor of the system.
2. Derive the EMF equation of a DC generator.
3. Explain how short circuit test is performed on a single phase transformer.
4. A 250 V, 50 Hz voltage is applied across a circuit consisting of a pure resistance of 20 Ω. Determine
   (a) the current flowing through the circuit
   (b) power absorbed by the circuit
   (c) power factor
   (d) peak value of voltage applied
5. A 4 pole 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate
   (a) the speed at which the magnetic field of the stator is rotating
   (b) the speed of the rotor when the slip is 0.04
   (c) frequency of rotor current when the slip is 0.03
6. Explain why single phase induction motors are not self-starting. Discuss in brief about one technique that can make the motor self-starting.
7. Discuss the need for earthing in electrical supply systems.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. Illustrate the construction and working of a DC motor. List the methods of speed control of a DC shunt motor.
2. Discuss the construction and working of a three phase induction motor.

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