KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2020 Admission
I Semester Final Examination-November 2021

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

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

1. The form factor of sinusoidal wave is _____.
2. The impedance of a series RLC circuit is _____ when applied voltage and current are in phase.
3. In a star connected three phase system, the phase angle in line voltage and phase voltage is _____.
4. The speed of an induction motor _____ with increase in supply frequency.
5. At _____, power factor of parallel RLC circuit is unity.
6. When rotor resistance is equal to its reactance, the starting torque of an induction motor is _____.
7. The reactance offered by a capacitor to an alternating current of frequency 50 Hz is _____ ohm. If frequency is increased to 100 Hz reactance becomes 5 Ohm.
8. The r.m.s value of sinusoidal AC current is equal to its value at an angle of _____degree.
9. A Current given by $i = 14.14 \sin(\omega t+\pi/6)$ has an r.m.s value of _____ amperes.
10. In a series RL circuit V_L _____ V_R by 90 degree.

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

1. With the help of neat diagrams, explain construction of induction motor.
2. Explain the efficiency of transformer and condition for maximum efficiency.
3. Explain briefly the concept of double field revolving theory in case of single-phase induction motor.
4. State Faraday's and Len's laws of electromagnetic induction.
5. What are the factors that are used to control the speed of DC series motor?
6. Prove mathematically that the resultant flux produced by the stationary coils of induction motor is constant in magnitude.
7. Write a mathematical relationship for delta to star conversion of impedance.

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

1. Explain complete speed vs toque characteristics of induction machine.
2. Explain with help of diagram the equivalent circuit of single-phase transformer.
3. Discuss power measurement in three-phase system.
4. Drive condition for maximum efficiency of DC generator.
5. Give comparison of DC shunt and series motors.
6. Compare magnetic circuit with electric circuit.
7. Explain 4-point starter required for DC motor.

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

1. Explain with the help of neat phasor diagram, the concept of transformer on load.
2. Derive an expression for running torque of a three-phase induction motor.

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