FMP 1115   **Basic Electrical Engineering (2+1)**   **Marks: 50**
         Time: 2 hours

I   **Fill in the blanks**   **(10x1=10)**
1. The Unit of Magnetic flux density is...............
2. For a star connected network the line current is .... phase current.
3. In 3 phase power measurement, when one wattmeter reads 0 then the power factor is..........
4. Commutator performs .... so that output of the machine is unidirectional.
5. If average load is 40 kw and maximum demand is 100 kw then Load factor is ....
 State True or False
6. The frequency of an alternating current is the speed with which the alternator runs.
7. In an AC circuit a low value of KVAR compared with KW indicates high power factor.
8. Single phase induction motors are self starting.
9. A relay is an electrically operated switch that opens and closes circuits by receiving electrical signals from external sources.
10. ELCB helps reduce fire hazards caused by overheating of wires due to overload or insulation breakdown.

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**
1. Explain RMS value and Average value of a sinusoidal waveform.
2. Define EMF and MMF. Also mention their units.
3. Draw the voltage triangle of a series R-L circuit.
4. Draw the phasor diagram of transformer in No Load condition.
5. Define Voltage regulation of a transformer. Write its formula.
6. Why DC series motors are never started in No-Load condition?
7. Define Power factor and Load factor.

III   **Answer ANY FIVE of the following**   **(5x4=20)**
1. Explain the 3 phase power measurement using two-wattmeter method.
2. Explain the construction and working of a transformer.
3. Staring from fundamentals, derive the EMF Equation of a Transformer.
4. Draw the Equivalent circuit of a single phase induction motor and mark all the electrical parameters.
5. Explain the principle behind the production of Rotating Magnetic Field.
6. Explain the different methods of power factor improvement.
7. What is a circuit breaker? Explain the working of an ELCB.

IV   **Write an essay on ANY ONE of the following**   **(1x10=10)**
1. Explain the sinusoidal response of a series RLC circuit. Derive the equation of current flowing in the circuit and draw the voltage triangle and impedance triangle.
2. Explain Double field revolving theory. Also explain the construction and principle of operation of phase split and shaded pole motors.

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