UNIT I: ELECTRICAL CIRCUITS & MEASUREMENTS

Two-mark Questions:

1. **What is Ohm's Law?**
   - **Answer:** Ohm's Law states that the current flowing through a conductor between two points is directly proportional to the voltage across the two points, provided the temperature remains constant. Mathematically, it is expressed as V=IRV = IRV=IR, where VVV is the voltage, III is the current, and RRR is the resistance.
2. **Define RMS value in AC circuits.**
   - **Answer:** The RMS (Root Mean Square) value of an AC current is the square root of the average of the squares of all instantaneous values of the current over one complete cycle.
3. **State Kirchhoff's Current Law (KCL).**
   - **Answer:** Kirchhoff's Current Law states that the total current entering a junction in an electrical circuit is equal to the total current leaving the junction.
4. **State Kirchhoff's Voltage Law (KVL).**
   - **Answer:** Kirchhoff's Voltage Law states that the sum of all electrical potential differences around any closed network is zero.
5. **What is the peak value of an AC signal?**
   - **Answer:** The peak value of an AC signal is the maximum value (positive or negative) that the waveform reaches during one cycle.
6. **Define power factor.**
   - **Answer:** Power factor is the ratio of real power (P) to apparent power (S) in a circuit and is a measure of how effectively the current is being converted into useful work. It is given by cos⁡(φ)\cos(\phi)cos(φ), where φ\phiφ is the phase angle between voltage and current.
7. **What is the principle of a moving coil instrument?**
   - **Answer:** A moving coil instrument works on the principle that a current-carrying conductor placed in a magnetic field experiences a force proportional to the current, causing the coil to move and indicate the measurement.
8. **What is a dynamometer type wattmeter?**
   - **Answer:** A dynamometer type wattmeter measures power in AC circuits. It consists of fixed and moving coils; the moving coil deflects in proportion to the power flowing through the circuit.
9. **Define energy meter.**
   - **Answer:** An energy meter measures the total amount of electrical energy consumed by a load over a period of time. It is commonly used in residential and industrial settings to monitor electricity usage.

10. **What are peak value and RMS value of a sinusoidal waveform?**
    - **Answer:** The peak value is the maximum value of the waveform. The RMS value is Vpeak2\frac{V_{peak}}{\sqrt{2}}2Vpeak for a sinusoidal waveform.
11. **Define the term 'amperes' in electrical circuits.**
    - **Answer:** Ampere is the unit of electric current in the International System of Units (SI). It represents the flow of one coulomb of charge per second.
12. **What is the function of a voltmeter?**
    - **Answer:** A voltmeter is used to measure the electrical potential difference between two points in an electric circuit.
13. **Define electrical power in terms of voltage and current.**
    - **Answer:** Electrical power is the rate at which electrical energy is transferred by an electric circuit. It is given by the product of voltage and current, P=VIP = VIP=VI.
14. **What is the significance of the power factor in electrical systems?**
    - **Answer:** Power factor indicates the efficiency with which the electrical power is being used. A higher power factor signifies more efficient utilization of electrical power.
15. **Explain the principle of operation of a moving iron instrument.**
    - **Answer:** A moving iron instrument operates on the principle that a soft iron piece moves when placed in a magnetic field, and the amount of deflection is proportional to the strength of the current passing through the coil.