Short answers type

1. What are the different components of a DC power supply?
A. Transformer, Rectifier, Filter and Regulator.

2. Why is it necessary to include voltage stabilizer/voltage regulator in a power supply?
A. The magnitude of output dc voltage may vary with the variation of either the input ac voltage or the magnitude of load current. So, at the output of a rectifier-filter combination a voltage stabilizer is required.

3. What is difference between half and full-wave rectifier?
A. A half-wave rectifier uses only one diode and allows current flow during the positive half-cycle of an alternating current (AC) input, resulting in a pulsating direct current (DC) output. In contrast, a full-wave rectifier employs at least two diodes to enable current flow during both the positive and negative half-cycles, producing a smoother DC output with higher efficiency. Full-wave rectifiers are more commonly used in practical applications due to their superior performance compared to the less efficient half-wave rectifiers.

4. Define ripple as referred to in a rectifier circuit.
A. The ac component contained in the pulsating output of a rectifier is known as ripple.

5. Explain the role of filter in rectifiers.
A. A filter circuit is a device which removes the a.c. component of rectifier output but allows the d.c. component to reach the load. A filter circuit should be installed between the rectifier and the load and it is a combination of inductors (L) and capacitors (C).

6. What is the condition for Zener diode to acts as a voltage stabilizer/regulator?
A. A zener diode can be used as a voltage regulator to provide a constant voltage from a source whose the input voltage E_i and load resistance R_L may vary over a wide range as long as the input voltage does not fall below the zener breakdown voltage V_Z.

7. What are the three functional components of electronic instrumentation?
A. The three elements of instrumentation are the sensor, the signal conditioning, and the data acquisition system.

8. What is the purpose of a digital voltmeter? Or Advantages of DVM compared to analog meters.
A. A digital voltmeter (DVM) displays the value of a.c. or d.c voltage being measured directly as discrete numerals in the decimal number system. Numerical readout of DVMs is advantageous since it eliminates observational errors committed by operators.

9. What is a CRO used to measure?
A. CRO is a very versatile instrument in the laboratory for measurement of voltage, current, frequency and phase angle of any electrical quantity.

10. What is the electron gun in a CRO?
A. The electron gun assembly of a CRO consists of an indirectly heated cathode, a control grid, a focusing anode and an accelerating anode and it is used to produce a focused beam of electrons.

Subjective Type

1. Explain the components of Regulated Power Supply (RPS) with neat diagram.
2. Describe the working of a half-wave rectifier using a crystal diode with waveforms and derive its efficiency.
3. With a neat sketch, explain the working of Full-wave bridge rectifier and derive an expression for the efficiency.
4. Describe the action of the capacitor (C) filter with relevant circuit diagram and waveforms.
5. Explain how zener diode maintains constant voltage across the load.
6. Illustrate the electronic instrumentation system with neat diagram.
7. Explain the working of Digital Voltmeter (DVM).
8. Explain the operation of Cathode Ray Oscilloscope (CRO) with a neat diagram.