



3. Explain with neat diagrams RLC series circuit. What is series resonance in RLC circuit? Also derive the relationship between bandwidth and quality factor in series resonant conditions.
4. What is single phase transformer? How does it transfer electric energy from one circuit to another? Derive the expression for the e.m.f. and voltage transformation ratio of an ideal transformer winding.
5. What is the working principle of generator? Write e.m.f. equation for lap wound and wave wound generator. Classify in detail the various types of generators.

### SECTION C

6. (a) Explain the working of controlled transistor series and transistor shunt voltage regulator.  
(b) A full wave use two diodes, the internal resistance of each diode may be assumed constant at  $25\ \Omega$ . The transformer r.m.s. secondary voltage from centre tap to each end of secondary is 60V and load resistance is  $750\ \Omega$ . Find:  
(i) The mean load current                      (ii) The r.m.s. value of load current
7. Explain the principle of operation, construction and working of linear variable differential transformer (LVDT).
8. Explain the operation of p-n junction diode in the forward and reverse biased conditions. Explain characteristics of p-n junction diode in forward and reverse region.
9. (a) Explain the working of SR flip- flop in detail.  
(b) Represent the decimal number 150 into binary, octal form, hexadecimal form.  
(c) State and prove Demorgan's theorems.