Conclusions:

In view of overall investigations the following conclusions have been drawn in brief on the present thesis work:

1. So for as the $Li_2O–CaO–Al_2O_3–P_2O_5–SiO_2$ bioglass system is concerned it can be concluded that the amount of Al_2O_3 should be limited up to 1.5 mol% in the glass for a proper balance between better bioactivity, physico-chemical and mechanical properties for a more suitable bioactive ceramics as an implant material. The FTIR absorption spectra, pH behaviour, XRD and SEM images indicated the formation of HCA layer on the surfaces of the bioglasses after immersion in SBF.
2. An investigation with $SiO_2–CaO–P_2O_5–K_2O–Al_2O_3$ bioactive glasses suggests that the material could be useful in bone replacement for clinical cases. The bioactive glasses have demonstrated high degree of tolerance for the RBC and WBC which strongly support its suitability as a viable alternative for bone replacement which could be achieved as per modifications in molar ratios of Al_2O_3 to K_2O in the glass which would make them biocompatible.
3. Further studies on $SiO_2–CaO–P_2O_5–SrO–Al_2O_3$ bioactive glasses suggest that the material could be used in bone replacement for clinical cases. Because FTIR absorption spectra, pH behaviour, XRD and SEM images have indicated the formation of HCA layer on the bioglass surfaces after immersion in SBF and these glass samples support the growth of the cells without causing any significant loss of viability and cell death. Osteosarcoma cells were found to grow on the surface of the bioglasses which makes them biocompatible and fit for use.

4. Studies on physical, bioactive, mechanical and antibacterial properties of CuO doped SiO_2- CaO- Na_2O-P_2O_5 bioglasses have shown that they can be used as implant material with their antibacterial properties because FTIR absorption spectra, pH behaviour, XRD and SEM images have indicated the formation of HCA layer on the surface of the bioglasses after immersion in SBF. The incorporation of CuO beyond 0.5 mol% was found to show antibacterial properties in bioglasses.
5. The studies on physical, bioactive and mechanical properties of (TiO_2+ZrO_2) substituted SiO_2-CaO-Na_2O-P_2O_5 bioglasses have shown that they can be used as an implant material because FTIR transmission spectra, pH behaviour, XRD and SEM images indicated the formation of HCA on the surface of the bioglass samples after immersion in SBF. So, it can be concluded that substitution of (TiO_2+ZrO_2) for SiO_2 in the 45S5 bioglass would be a better bioactive material possessing enhanced mechanical properties in comparison to 45S5 bioglass.