CONCLUSIONS

From the undertaken study, the following conclusions are drawn:

- The addition of flyash in concretes enhances compressive strength of concretes with time.
- The water to cementitous ratio used in preparation of concretes is ideal for quality concrete as verified by slump cone test of workability.
- Lead-flyash concrete is the best suited for the purpose of radiation shielding which has been confirmed by gamma ray interaction and health physics characteristics among the tested flyash concretes with different admixtures.
- High volume flyash concrete offers enough possibility for its utilization as radiation shielding material as it has satisfactory mechanical and radiation properties.
- In multiple scattering studies a multiple scatter peak is reported for high volume flyash concretes at energy of about 80 keV, which is a contribution to literature.
- The multiple scatter peak is found to be independent of incident energy as well as the thickness of target. It is only a characteristic property of material, whereas the intensity of multiple scatter peak decreases exponentially with increase in thickness of target.
- In the multiple scattering experiment, the peak to valley and peak to total ratio for transmitted photon spectra of $^{137}$Cs and $^{60}$Co through high volume flyash concrete decreases with increase in its thickness, confirming the multiple scattering of photons.
- From study of radiation dose parameters, it is reported that the radiation shielding with flyash concretes reduces exposure and dose by a significant amount. Despite of high activity of the order of 100 mCi, gamma source can be safely handled with appropriate shielding of flyash concretes.
The results of equivalent dose rate, effective dose rate and energy fluence rate with shielding of flyash concretes states that biological effects of the gamma radiation for different parts can be significantly reduced.

There is no significant unwarranted effect of flyash utilization in concretes on radiation attenuation parameters.