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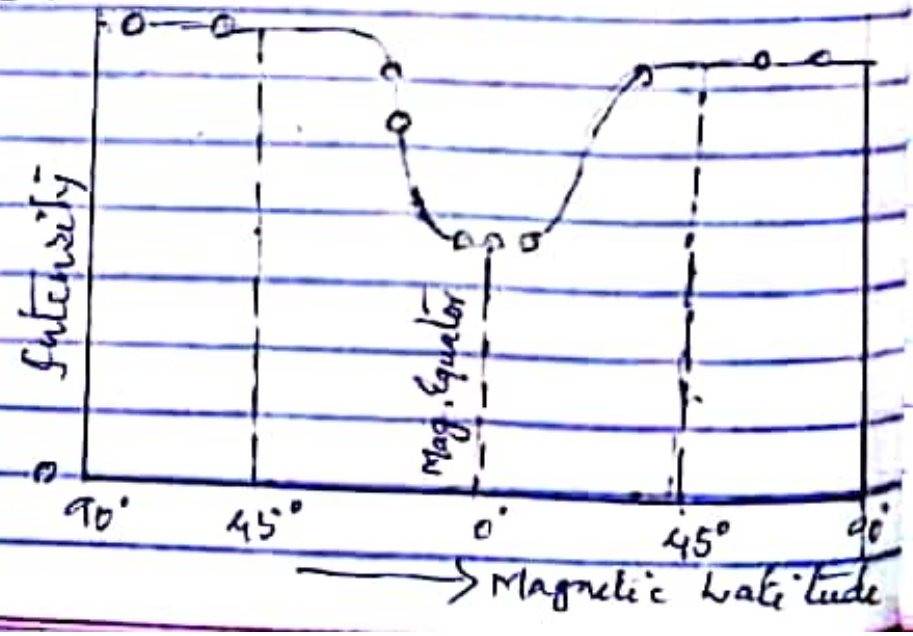
B-3(H) Paper VI

Write short notes on :-

(i) Latitude effect
(ii) Altitude effect
(iii) East - west asymmetry effect.

(i) Latitude Effect :- In the year 1931, the Dutch Physicist, J. Clay reported variations in the cosmic ray intensities with latitude. The measurement of cosmic ray intensities by him at various latitude revealed that starting from the latitude of 90°, the cosmic ray intensity remained constant until a latitude of about 50° was reached. Thereafter, the intensity began to drop appreciably till it was minimum at the equator. Same symmetrical rise in intensity was recorded in



the Southern hemisphere. There was some uncertainty whether the intensity of cosmic rays is constant between the latitudes of 50° & 90°, which would mean that no primary cosmic rays particles with energy less than about 1500 MeV can reach the earth's atmosphere. Later investigations showed that there is actually some increase in the intensity from 50° to 90° latitudes.

The variations in the cosmic ray intensity at different geomagnetic latitudes can be understood by considering the effect of mag. field on cosmic rays. The presence of such effect clearly shows that the cosmic rays are charged particles, which otherwise would not be affected. At the equator, the earth's mag. field is perpendicular to the direction of motion of cosmic rays particles, which thus suffer max^m deflection. Hence their intities is minimum at the equator. At poles, however, the particles approach parallel to the earth's field and hence suffer min^m deflection, which implies maximum intensity of cosmic rays at the poles.