Que: Distinguish between Freshnel and Fraunhoffer's diffraction. Discuss Fresnel diffraction at a straight edge?

Ans: Difference between Freshnel and Fraunhoffer's diffraction:→

(i) In Fraunhoffer diffraction the source of light and the screen are effectively at infinite distance from the diffracting element. this condition is achieved by rendering the incident and diffracted beams parallel by using convex lense. In

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fresnel class of diffraction either the sources of light or the screen or both are not finite distances from the diffracting element (apertures or obstacles) thus in fraunhoffer's diffraction the angular inclination are important while in fresnel class the distance are important.

(ii) In fraunhoffer diffraction the incident wave from it often plane. while is fresnel diffraction the incident wave-front is

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divergent either spherical or cylindrical. the plane wave-front is not the essential requirement for fraunhoffer's diffraction, because fraunhoffer's diffraction may also be obtained with cylinder or spherical wave fronts

(iii) In fraunhoffer's class of diffraction, the effect of a number of diffracting elements can be combined suitable, while it is not so in fresnel class of diffraction.

(iv) The theoretical treatment of fraunhoffer class is simple while that of fresnel class approximate.