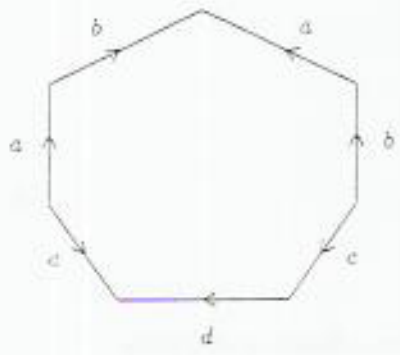
Question 9

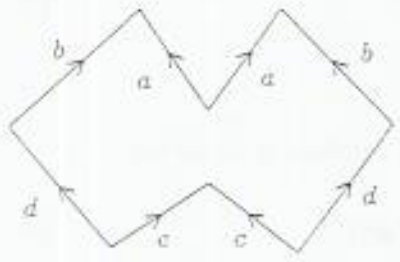
Each of the following polygons or sets of polygons represents a subdivision of a surface. In each case find the number of vertices of the subdivision and hence determine χ (the Euler characteristic) and β (the number of boundary components) of the surface. Also state whether or not the surface is orientable and hence write down the surface as a connected sum of copies of S^2, T^2, $\mathbb{RP}^2$ and D^2.

(i)



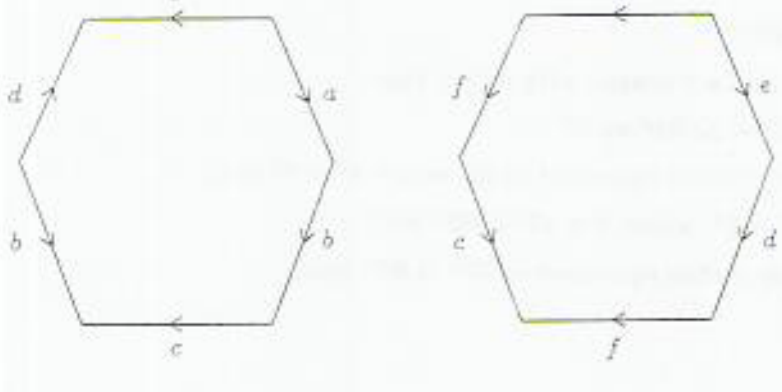
[3]

(ii)



[4]

(iii)



[4]