

QUEEN MARY AND WESTFIELD COLLEGE

MAS 417

Association Schemes and Partially Balanced Designs

Assignment 3

For handing in on 6 March 2001

- 1 Give an alternative proof that the space W spanned by χ_Ω is always a stratum by showing directly that
 - (a) χ_Ω is an eigenvector of every adjacency matrix;
 - (b) there is at least one matrix M in \mathcal{A} which has W as a whole eigenspace.
- 2 Prove the two orthogonality relations for the D matrix.
- 3 Find the character table, and the D matrix, for the cube association scheme.
- 4 Use the Bose-Mesner isomorphism to find the character table of $T(6)$.
Can you identify the eigenvectors in a simple form?