Preface

Arad and Chen proved in [AC] and [AC1] that a Normalized Integral Table Algebra (fusion ring) (A, B) generated by a non-real faithful element $b_3 \in B$ of degree three the non-identity elements of which have minimal degree 3 satisfies the condition $b_3\bar{b}_3 = 1 + b_8$ where $b_8 \in B$ is an element of degree 8. They also showed that the general case naturally splits into four main sub-cases:

(1) $(A, B) \cong_x (CH(PSL(2, 7), Irr(PSL(2, 7)))$;
(2) $b_3^2 = b_4 + b_5$ where $b_4, b_5 \in B$ are elements of degrees 4 and 5;
(3) $b_3^2 = \bar{b}_3 + b_6$ where $b_6 \in B$ is a non-real element of degree 6;
(4) $b_3^2 = c_3 + b_6$ where $c_3, b_6 \in B$ are elements of degrees 3 and 6, $c_3 \neq b_3, \bar{b}_3$.

The cases (1), (3) and (4) are considered in Chap. 2. Chapter 3 deals with the case (2). Chapters 4 and 5 analyze the most complicated case—the third one. We developed new original methods for enumerating NITAs in the title. Using the developed technique we settled the above cases almost completely.

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