

Problem Set 6(50 points)

Question 1 (Zee II.1 Q4). [10 points] In chapter I.2, we worked out the equivalence classes of S_4 . Calculate the characters of the 4-dimensional representation of S_4 as a function of its classes.

Question 2 (Zee II.3 Q1). [20 points] How does the 4-dimensional regular representation of A_4 reduce?

Question 3 (Zee II.3 Q3). [10 points] Determine the character table of S_4 , and check the various orthogonality theorems.

Question 4 (Zee II.3 Q4). [10 points] Complete the table in (19).

Question 5 (****). [10 points] Find irreducible representations of the quaternionic group \mathcal{Q}

Question 6 (Zee II.3 Q6). [10 points] For $n \geq 5$, any two 3-cycles in A_n are equivalent. Why is the restriction $n \geq 5$ needed?

Question 7 (Zee II.3 Q7). [10 points]

Work out the character table for $D_5 = C_{5v}$, the invariance group of the pentagon. You will find, perhaps surprisingly (perhaps not), that the character table for D_5 is smaller than the character table for D_4 .

SEND TO GROUPTHEORY.SUT@GMAIL.COM WITH SUBJECT ID+HW#N ¹

¹ex:98203078Hw6