

國立澎湖科技大學
九十八學年度研究所入學考試試題

科目：Discrete Mathematics

—作答注意事項—
考試時間：100 分鐘

祝考試順利

國立澎湖科技大學 98 學年度研究所入學考試試題電資所

科目：Discrete Mathematics

※Attention: This examination paper altogether 5 big topics, each topic 20%.

1. Thirty cars were assembled in a factory. The options available were a radio, an air conditioner, and white-wall tires. It is known that 15 of the cars have radios, 8 of them have air conditions, and 6 of them have white-wall tires. Moreover, 3 of them have all three options, We want to know at least how many cars do not have any options at all.

2. Let $A = \{a, b, c, d, e\}$ and let $\rho = \{(a, b), (b, a), (a, c), (c, e), (d, b)\}$ be a binary relation, $n \in \mathbb{N}$ (\mathbb{N} is the set of positive integral number). Show that ρ^n .

3. Let $a_\gamma = \sum_{i=1}^{\gamma} i^2$ be a numeric function for $\gamma \geq 0$, show that the generation function.

4. The solutions of the difference equation

$$a_\gamma + 5a_{\gamma-1} + 6a_{\gamma-2} = 3\gamma^2 \text{ and } \gamma \geq 0.$$

5. For each of the following sets of weights, construct an optimal binary prefix code. For each weight in the set, give the corresponding code word.

- (a) 8, 9, 12, 14, 16, 19. π
- (b) 1, 2, 4, 5, 6, 9, 10, 12. 4^9
- (c) 5, 7, 8, 15, 35, 40. 110