

中央警察大學 102 學年度碩士班入學考試試題

所 別：水上警察研究所

科 目：專業英文(同等學力加考)

作答注意事項：

1. 本試題共 4 題，每題各占 25 分；共 2 頁。
2. 不用抄題，可不按題目次序作答，但應書寫題號。
3. 禁用鉛筆作答，違者不予計分。

一、請寫出下列「英文字詞」的中文翻譯（25 分）

- | | |
|---------------------|-------------------|
| 1. Brackish water | 2. Disphotic zone |
| 3. Ebb current | 4. Diurnal tide |
| 5. Osmotic pressure | |

二、請將下列「英文段落」譯成中文（25 分）

Every drop of water in the top 100 meters of the ocean contains thousands of free-floating, microscopic flora called phytoplankton. These single-celled organisms, including diatoms and other algae, inhabit three quarters of the earth's surface, and yet they account for less than 1 percent of the 600 billion metric tons of carbon contained within its photosynthetic biomass. But being small doesn't stop this virtually invisible forest from making a bold mark on the planet's most critical natural cycles.

三、閱讀下列短文後，回答後續問題（25 分）

Maritime navigation is a process that depends heavily and crucially on the navigator's experience and judgment, as there are no specific rules governing the optimum use of navigational systems and techniques apart from the general rules outlined in collision regulations (COLREGS) coupled with the traditional practices of seamanship. Currently, collision avoidance maneuvers for local traffic or obstacles are usually performed under the navigator's own reaction and judgment, even though there are numerous navigational advising equipments available on the bridge (e.g. Automatic Identification System (AIS) and automatic radar plotting aid (ARPA)). Nevertheless, navigators usually take the safety of the ship as the first priority while the other aspects (e.g. fuel saving and transverse distance) are mostly treated as secondary issues having a lower priority. This practice was acceptable for many decades but increasing sea-borne trading has greatly elevated marine traffic so that congestion is now a significant problem. Furthermore, and particularly in littoral, the average cruise speed of ships is increasing. As a notable number of accidents at sea are associated with human error; so close range collision avoidance methods have become an important subject in marine navigation.

The majority of the studies in this area are focused on collision free maneuvers and recently some investigations have been conducted on path planning. Traditionally path planning

algorithms originate from:

- i. Land-based robotic navigation e.g. rule-based expert systems or combinatorial motion planning,
- ii. Iterative non-deterministic optimization algorithms from other areas e.g. dynamic programming or genetic algorithm.

However, the major difficulties in adopting such approaches were the incorporation of COLREGS and the practice of seamanship. Unlike land-based navigation, the rules for ship encounters are unique and specific to each encounter. In addition to the regulations, the dynamics of ships are also highly complex and depend upon many factors such as hull-form and speed, as well as environmental conditions. There are still no universally agreed solutions to incorporate such factors and up to now all reported studies have either disregarded the regulations, employed specific databases or used different safety domain geometries to emulate COLREGS; and have assumed a highly simplified version of the ship dynamic model.

(Adapted from Tam, C. K., Bucknall, Rand Greig, A. (2009), "Review of Collision Avoidance and Path Planning Methods for Ships in Close Range Encounters", Journal of Navigation, vol. 62, pp. 455-476.)

1. What is the aim of this article?

- (A) Discussion of the difficulties encountered in path planning algorithms for close range collision avoidance.
- (B) Maritime navigation depends heavily and crucially on the navigator's experience and judgment.
- (C) Close range collision avoidance methods have become an important subject in marine navigation.
- (D) Congestion is currently a significant problem.

2. In this article, which factor does not play crucial role in collision avoidance maneuvers?

- (A) Navigation's reactions
- (B) Experience
- (C) Talent
- (D) Judgment

3. What is the meaning of "increasing sea-borne trading has greatly elevated marine traffic" in this article?

- (A) The increasing sea-borne trading has greatly influenced marine traffic.
- (B) The increasing sea-borne trading has greatly raised marine traffic.
- (C) The increasing sea-borne trading has greatly impaired marine traffic.
- (D) The increasing sea-borne trading has greatly formed marine traffic.

4. Which area does "littoral" mean in this article?

- (A) Open sea
- (B) Shallow water
- (C) Coast area
- (D) Inland waterway

5. What does "emulate" mean in this article?

- (A) Compete with
- (B) Replace
- (C) Disregard
- (D) Ignore

四、Please write an essay (at least 250 words) to describe your knowledge and opinions about the renewable energies possibly generated from the ocean. Can they take place of nuclear energy in the future? Why or why not? (25 分)