國立嘉義大學九十五學年度
水生生物科學系碩士班招生考試試題

科目：專業英文

英翻中（每題 25%）

1. Organisms living in the littoral zone may also experience oxygen deficits during summer. In shallow areas with a high density of primary producers, such as submerged macrophytes and substrate-associated algae, dissolved oxygen levels change following a diel cycle. During daytime the photosynthetic activity is high in this well-lit habitat, resulting in high production of oxygen and saturation levels above 100%. During night-time, when the plants consume oxygen by respiration, dissolved oxygen in dense stands of submerged macrophytes may be eradicated. In addition, in late summer when temperatures in shallow areas are high, decomposition processes may be so intense that plants start to die and oxygen can be completely depleted, resulting in catastrophic die-offs, especially of fish.

2. An improved understanding of how resistance emerges and is selected for among bacteria is essential in evaluating the impact of aquacultural use of antibacterial agents, identifying the high risk procedures and designing ways to reduce these effects. Bacteria acquire resistance by acquisition of foreign DNA or by modification of the chromosomal DNA. Examples of both are found among bacterial fish pathogens, and these are well illustrated in relation to the tetracyclines and the quinolones. A brief consideration of these compounds is helpful in elucidating the causal relationship of drug use and emergence of resistance and in planning intervention strategies to reduce negative effects.

3. Defining “organic aquaculture” is very much a work-in-progress and, for many reasons, an endeavor marked by controversy. Members of both the organic and the aquaculture communities disagree on how, or even if, aquatic animal and plant production systems can qualify as “organic” as the term is commonly used. Any potential definition must be a multi-faceted one. “Organic” in the context of food production connotes standards and certification – a verifiable claim for the production process and production practices – as well as more elusive characteristics such as consumer expectation for food quality and safety and general environmental, social, and economic benefits for farmers and for society. The variety of species produced in aquacultural systems and vast differences in cultural requirements for finfish, shellfish, mollusks, and aquatic plants add to the complexity of defining this sector. Some species and some production systems may prove quite difficult to adapt to a traditional “organic” system.

4. Several organic and inorganic compounds can find their way into fish and seafood. These compounds can be divided into three major groups:

- **Inorganic chemicals**: arsenic, cadmium, lead, mercury, selenium, copper, zinc and iron.
- **Organic compounds**: polychlorinated biphenyls (PCBs), dioxins and insecticides (chlorinated hydrocarbons). This is a very diverse group with a wide range of industrial uses and a chemical stability that allows them to accumulate and persist in the environment.
- **Processing-related compounds**: sulphites (used in shrimp processing), polyphosphates, nitrosamines and residues of drugs used in aquaculture (e.g. antibiotics or hormones).