

國立臺灣海洋大學 95 學年度研究所碩士班暨碩士在職專班入學考試試題

系所別：海洋生物研究所

考試科目：普通生物學(一)

答案卷請以橫式由左至右書寫

一、問答題

試說明海洋哺乳動物之潛水生理及適應方式 (13%)

二、解釋名詞 (每題 4%，共 20%)

1. Diabetes mellitus
2. Acetylcholine
3. Somatic nervous system
4. Thermoreceptor
5. Osmoregulator

三、In an electron-shell diagram of sodium, in which shell do electrons have the most potential energy? In which shell do electrons have the least potential energy? What kind of the bond is between sodium and chlorine in sodium chloride? Why? (The atomic number of sodium is 11, and chlorine is 17). (6%)

四、What properties of  $O_2$  allow  $O_2$  to cross a lipid bilayer without help from membrane proteins? Why would water molecules need a transport protein (aquaporin) to move rapidly and large quantities across a membrane? (5%)

五、In the light reactions of photosynthesis, what is the electron donor? Where do the electrons end up? What color of light is least effective in driving photosynthesis? Explain. (6%)

六、Please explain why nitrogen-fixing bacteria are important in agriculture as well as aquaculture. Compare root nodules and mycorrhizae. (5%)

七、Please compare and contrast the forces that move phloem sap versus the forces that move xylem sap over long distance in plants. (5%)

八、Please explain endocytosis and exocytosis. Does the plasma membrane expansion in cell growth involve endocytosis and exocytosis? (6%)

九、解釋名詞 (每題 2% , 共 20%)

1. standard metabolic rate and basal metabolic rate
2. heat shock protein
3. cardiac cycle
4. respiratory pigment
5. inflammatory response
6. apoptosis
7. active and passive immunization
8. anhydrobiosis
9. menopause
10. rhodopsin

十、問答題(共 14%)

1. How does the Bohr shift help deliver  $O_2$  to very active tissue? (4%)
2. Describe osmoregulation in a saltwater fish and in a freshwater fish. (5%)
3. List the major known neurotransmitters and their secretion sites. (5%)