

# 國立嘉義大學九十七學年度

## 農業生物技術研究所碩士班招生考試試題

### 科目：專業英文

請將下列英文短文翻譯成中文

1. The cell has a special place in the hierarchy of biological organization. It is the lowest level of structure that can perform all activities required for life. A cell can regulate its internal environment, take it and use energy, respond to the environment around it, and develop and maintain its complex organization. (10分)
2. To manipulate genes in the laboratory, biologists often use bacterial plasmids, which are small, circular DNA molecules that replicate separately from the much larger bacterial chromosome. Because plasmids can carry virtually any gene and replicate in bacteria, they are key tools for gene cloning, the reproduction of multiple identical copies of a gene-carrying piece of DNA. (15分)
3. More than 100 years ago the first efforts were made for the culture of plant cells and tissues in vitro. The discovery of some plant hormones some 50 years ago enabled the first successful growth of plant tissue to occur. The potential of plant tissue cultures for the production of fine chemicals was then realized and the first efforts with cultures of plant roots were described in 1954. Plant tissue culture then developed into a major method for large-scale micropropagation of many ornamental plants and cut flowers. (15分)
4. Each plant species has its own set of secondary metabolites that helps it to survive in its environment. These compounds are very varied and include metabolites that are involved in the attraction of pollinators (flower colours and fragrance) and defense against insects and microorganisms. (10分)
5. A large fraction of human genes are members of gene families where individual genes are closely related but not identical on sequence. In many such cases the genes are clustered and have arisen by tandem gene duplication, as in the case of the different members of each of the  $\alpha$ -globin and  $\beta$ -globin gene clusters. Genes which encode clearly related products but which are located on different chromosomes are generally less related, as in the case of the  $\alpha$ -globin and  $\beta$ -globin genes. However, in the case of the HOX homeobox gene family, which consists of clusters of approximately 10 genes on each of four chromosomes, individual genes on different chromosomes may be more related to each other than they are to members of the same gene cluster. In addition to the above, genes encoding closely related tissue-specific isoforms, or subcellular

compartment-specific isozymes are often located on different chromosomes. (This paragraph is adopted from Human Molecular Genetics 3.) (25分)

6. All systems of the body contribute toward maintaining homeostasis and therefore a relatively constant internal environment. The cardiovascular system conducts blood to and away from capillaries, where exchange occurs. The heart pumps the blood and thereby keeps it moving toward the capillaries. The formed elements also contribute to homeostasis. Red blood cells transport oxygen and participate in the transport of carbon dioxide. Platelets participate in the clotting process. The lymphatic system is accessory to the cardiovascular system. Lymphatic capillaries collect excess tissue fluid, and this is returned via lymphatic veins to the cardiovascular veins. Lymph nodes help purify lymph and keep it free of pathogens. This action is assisted by the white blood cells that are housed within lymph nodes. (25分)