國立嘉義大學九十三學年度
農學研究所博士班園藝組招生考試試題

科目：園藝專業英文

一、請將下列短文翻成中文（25%）

Effects of temperature and/or gibberellic acid (GA_3) on flowering of Aglaonemas were studied under phytotron conditions in order to synchronize flowering for pollination and hybridization. Aglaonemas were stimulated in April, May and June by treatment under temperatures of 30/25 and 25/20℃ in early March. High temperature of 35/30℃ resulted in the deformation of spathes and inflorescence, while low temperatures of 20/15 and 15/13℃retarded or inhibited the unfolding of spathe and inflorescece development. Transferring Aglaonemas to greenhouse at 18-22℃, after a single spray of 250 ppm GA_3 in late November at 30/25 and 25/20℃ has increased the number of inflorescences and synchronized flowering March to May. Plants without GA_3 treatment showed no sign of flowering when the experiment was terminated after 185 days later.

二、請將下列短文翻成中文（25%）

Spathiphyllum ‘Sensation’ plantlets were transplanted and placed in a growth room at a temperature of 25±1℃ under cool-white fluorescent light providing 16 hr daily photosynthetic photon flux density of 35-150 μmol m^{-2} s^{-1}. After 10 to 30 days of acclimatization in the growth room, the plantlets were transferred to the greenhouse. The optimal irradiances ranged from 100 to 150 μmol m^{-2} s^{-1} during acclimatization. The 6 to 8-week-old plantlets *in vitro*, with 3 to 4 leaves and 30-33 mg dry weights, had greater subsequent *ex vitro* growth than did the 4 or 14-week-old plantlets. All the Fv/Fm values of in vitro formed leaves decreased on day 3, the value started to increase from day 7 and the Fv/Fm remained at 0.78 from day 15 to 30 after transplanting to soilless mix.

三、請說明下段文章主要的內容。 （25%）
(請以中文作答，畫底線的專有名辭可以直接使用英文。)

Soil microorganisms regulate the supply of nitrogen to plants and so are important controllers of plant productivity and ecosystem carbon sequestration. Johnson *et al.* report that exposure of a subarctic heath ecosystem to increased ultraviolet-B (UV-B) irradiation causes a drastic decline in the mass ratio of C:N in soil microorganisms,

which would increase the amount of nitrogen stored in the microbial biomass and possibly alter the availability of nitrogen to plants. However, we argue that some of the authors’ microbial C:N data are unrealistic, possibly because of an artefact of the technique used to measure microbial carbon and nitrogen concentrations. As a result, there is little reason to suppose that increased exposure of ecosystems to UV-B radiation will influence microbial nitrogen storage, plant nitrogen availability or rates of carbon sequestration.

四、根據下段文章之內容，請說明那些酵素參與蔗糖裂解及裂解後的產物？這些酵素存在於細胞內何處？（25%）
(請以中文作答，畫底線的專有名辭可以直接使用英文。)

The physical path of sucrose movement and site of its cleavage are central not only to mechanisms of import but also to the sugar signals generated. The mechanisms that regulate sucrose movement and cleavage also differ for each compartment. Depending on the path of sucrose entry into an importing structure (i.e. via plasmodesmata or across the cell wall space), sucrose can be cleaved by cell wall invertase (CWIN), cytoplasmic invertase (CIN), sucrose synthase (SUS), or vacuolar invertase (VIN). Cytoplasmic sucrose cleavage typically produces limited hexoses or hexose-based sugar signals because of the generally low activity of CIN and the production of UDPG instead of glucose by SUS. In contrast, sucrose that enters sinks via the cell wall space can generate significant amounts of glucose and other hexoses if CWIN is active. Glucose and fructose can, in turn, initiate hexose-based signals both at the membrane and during subsequent metabolism in the cytoplasm. Similarly, abundant hexoses and hexose-based signals can be generated in the vacuole by VIN; this constitutes the primary site of sucrose cleavage during the expansion phase of most sink tissues.