

**Please answer all the questions.** ※ 注意：請於試卷內之「選擇題作答區」依序作答。

**Please select the best answer from the choices provided.**

1. Which of the following do all fungi have in common? (2 marks)

- A) meiosis in basidia
- B) coenocytic hyphae
- C) sexual life cycle
- D) absorption of nutrients
- E) symbioses with algae

2. The hydrolytic digestion of which of the following should produce monomers that are animated (i.e., have an amine group attached) molecules of beta-glucose? (2 marks)

- A) insect exoskeleton
- B) plant cell walls
- C) fungal cell walls
- D) A and C only
- E) A, B and C

3. In the scenario where all decomposing fungi in an environment suddenly die, which group of organisms is expected to increase the most, given the absence of their fungal competitors? (2 marks)

- A) plants
- B) protists
- C) prokaryotes
- D) animals
- E) mutualistic fungi

4. When a mycelium infiltrates an unexploited source of dead organic matter, what are most likely to appear within the food source soon thereafter? (2 marks)

- A) fungal haustoria
- B) soredia
- C) fungal enzymes
- D) increased oxygen levels
- E) larger bacterial populations

5. What accounts most directly for the extremely fast growth of a fungal mycelium? (2 marks)

- A) rapid distribution of synthesized proteins by cytoplasmic streaming
- B) a long tubular body shape
- C) the readily available nutrients from their ingestive mode of nutrition
- D) a dikaryotic condition that supplies greater amounts of proteins and nutrients

6. In most fungi, karyogamy does not immediately follow plasmogamy, which consequently (2 marks)

- A) means that sexual reproduction can occur in specialized structures.
- B) results in multiple diploid nuclei per cell.
- C) allows fungi to reproduce asexually most of the time.
- D) results in heterokaryotic or dikaryotic cells.
- E) is strong support for the claim that fungi are not truly eukaryotic.

見背面

7. A chemical secreted by a female *Bombyx* moth helps the male of the species locate her, at which time sexual reproduction may occur. This chemical is most similar in function to which chemicals used by sexually reproducing fungi? (2 marks)

- A) chitin
- B) enzymes
- C) lysergic acids
- D) aflatoxins
- E) pheromones

8. If seeking guidance, which category would you assign this recently identified plant pathogenic fungus based on its filamentous structure, asexual reproduction, absence of sexual phase, and its ability to parasitize plant leaves? (2 marks)

- A) Deuteromycota
- B) Zygomycota
- C) Ascomycota
- D) Basidiomycota
- E) Glomeromycota

9. In the presence of pathogenic fungi on grapevine roots, grape farmers may adopt a practice of surrounding the soil nearby their vines with plastic sheeting and introducing a gaseous fungicide into the soil as a response. The most important concern of grape farmers who involve in this practice should be that the (2 marks)

- A) fungicide also kill the native yeasts exist in on the surfaces of the grapes.
- B) fungicide is not also harmful to insect pests.
- C) lichens growing on the vines' branches are not harmed.
- D) fungicide might also kill mycorrhizae.
- E) sheeting is transparent so that photosynthesis can continue.

10. The adaptive advantage associated with the filamentous nature of fungal mycelia is primarily related to (2 marks)

- A) the ability to form haustoria and parasitize other organisms.
- B) avoiding sexual reproduction until the environment changes.
- C) the potential to inhabit almost all terrestrial habitats.
- D) the increased probability of contact between different mating types.
- E) an extensive surface area well suited for invasive growth and absorptive nutrition.

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11. What is the scientific name for the fungus responsible for causing rice blast?  
(1 mark)

- A) *Colletotrichum gloeosporioides*
- B) *Magnaporthe oryzae*
- C) *Puccinia graminis*
- D) none of the above
- E) all of the above

12. What is the scientific name for the fungus that typically induces grey mold diseases in fruits? (1 mark)

- A) *Magnaporthe oryzae*
- B) *Puccinia graminis*
- C) *Botrytis cinerea*
- D) none of the above
- E) all of the above

13. What was the causative organism responsible for the Irish Potato Famine, primarily due to the occurrence of potato late blight? (1 mark)

- A) *Colletotrichum gloeosporioides*
- B) *Botrytis cinerea*
- C) *Phytophthora infestans*
- D) none of the above
- E) all of the above

14. What is recognized as one of the most crucial fungal pathogens in the field of molecular plant pathology, known for its involvement in causing a significant crop disease? (1 mark)

- A) *Magnaporthe oryzae*
- B) *Botrytis cinerea*
- C) *Puccinia graminis*
- D) *Fusarium oxysporum*
- E) *Ustilago maydis*

15. Which fungal group is primarily responsible for causing blue mold in apples and pears? (1 mark)

- A) *Colletotrichum*
- B) *Botrytis*
- C) *Phyllosticta*
- D) *Fusarium*
- E) *Penicillium*

見背面

※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

II. 植物病毒學部分 (25 分)

1. 請解釋下列名詞 (每小題 2 分，共 8 分)

- a. Cross protection
- b. Virus induced gene silencing
- c. Viroid
- d. Dark green islands (DGIs)

2. 請繪圖舉例說明任一 *Potyvirus* 屬病毒的基因表達策略 (4 分)

3. 請說明正股 RNA 植物病毒入侵細胞後至產生新病毒之感染史(infection cycle)。(7 分)

4. 媒介昆蟲傳播病毒可分為永續型、非永續型與半永續型傳播，請問三者特性為何？(6 分)

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III、

1. 請問下列植物病原細菌可引起的植物病害為何？並請說明病害診斷的要領。(每小題各4分)
  - (1) *Dickeya fangzhongdai*
  - (2) *Streptomyces scabies*
  - (3) *Xanthomonas fragariae*
2. 請問下列毒力因子的來源細菌為何？請寫出細菌學名，並請說明這些毒力因子的作用為何？
  - (1) Coronatine (4分)
  - (2) Amylovoran (3分)
3. 植物病原細菌 *Ralstonia solanacearum* 可在多種植物上危害，請問此類細菌如何入侵寄主造成萎凋病徵呢？並請說明不同菌系的分類系統為何？(6分)

IV. 植物線蟲學 (25%)

1. 松樹萎凋病由松材線蟲導致，請描述或文圖描繪松材線蟲之生活史(包含傳播模式及致病過程)。(7%)
2. 各種線蟲有其特殊之寄生模式，請依外寄生 (Ectoparasite)、半內寄生 (semi-endoparasite) 及固著型內寄生 (sedentary endoparasite) 各舉例兩種線蟲，並列出其中文名及學名。(18%)

試題隨卷繳回