

八十五學年度 生命科學 系(所) 分子與細胞生物甲組 生物醫學甲 組碩士班研究生入學考試  
 科目 微生物學 科號 0904 共 二 頁第 1 頁 \*請在試卷【答案卷】內作答

A. 試填入適當的字 (已寫出第一個字母) 完成敘述。(20%)

1. Almost all bacteria have cell walls. The only bacteria that do not have cell walls are the m \_\_\_\_\_.
2. A s \_\_\_\_\_ medium contains one or more chemicals that inhibit the growth of undesirable organisms while allowing the growth of those desired.
3. The c \_\_\_\_\_ includes a culture medium that contains an abundant supply of all the necessary nutrients, except one, which is in growth limiting concentration. The rate of population growth is regulated by the rate of the new medium input into the growth chamber, as the rate of new medium input is increased (an increase in the amount of the limiting nutrient), so is the rate of microbial growth.
4. A \_\_\_\_\_ techniques are the procedures used to avoid contamination or infection.
5. O \_\_\_\_\_ phosphorylation is the name given when a phosphorylated compound donates its phosphate group to an ADP molecule to form ATP. The free energy liberated during the electron transport is sufficient to power the synthesis of ATP.
6. If tryptophan is the only amino acid in short supply, the cell promotes translation of the *trp* operon structural genes; If tryptophan is in abundance, the cell shuts off the *trp* operon both by repression and by a \_\_\_\_\_.
7. D \_\_\_\_\_ growth is the pattern of population growth exhibited by certain bacteria when cultured in broths containing two different carbohydrates (e.g., glucose and lactose). The growth pattern involves the occurrence of two superimposed growth curves, with two lag phases and two exponential growth phases.
8. A h \_\_\_\_\_ is a cell formed from the fusion of a normal cell with a cancerous cell.
9. A c \_\_\_\_\_ is a fungal spore that arises from a mitotic division. These spores are readily airborne and serve to disperse the fungi to other habitats.
10. P \_\_\_\_\_ is a process in which certain cells called phagocytes engulf and digest particles and microorganisms.

B. 下列各題中皆有兩個詞或片語，試比較兩個詞或片語的意義。(48%)

1.  $F^+$  bacteria versus Hfr bacteria
2. Generalized transducing phage versus specialized transducing phage

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3. eubacteria versus archaeobacteria
4. lytic cycle versus lysogenic cycle
5. pathogenicity versus virulence
6. antigen versus antibody
7. DNA lesion versus mutation
8. nonsense mutation versus missense mutation
9. bacteriostatic versus bacteriocidal
10. transformation versus transfection
11. hnRNA versus mRNA
12. operon versus regulon

C. 問答題

1. 藻類生物在自然界扮演那些重要功能？試舉例說明之。(8%)

2. 可用來鑑定 (identify) 及類別 (classify) 微生物的特徵或性質 (characteristics) 包括

- (1) morphology,
- (2) stain characteristics,
- (3) physiology,
- (4) percent G+C,
- (5) DNA hybridization,
- (6) phage typing,
- (7) amino acid sequence,
- (8) serology 等。

對這八點特徵或性質，試各舉一例（可以由學理、方法、及/或微生物種類等方面來考慮）說明。(24%)