

國立中山大學100學年度碩士班招生考試試題

科目：微生物學【生科系碩士班乙組選考】

一、選擇題（每題 2 分，每題請選出一個最恰當的答案）50%

- 1) A sexually transmitted disease is an example of
A) Fomite. B) Vector. C) Droplet transmission. D) Direct contact.
E) Vehicle transmission.
- 2) Normal microbiota of the adult vagina consist primarily of
A) *Mycobacterium*. B) *Candida*. C) *Bacillus*. D) *Lactobacillus*. E) *Neisseria*.
- 3) Methane made from bacterial biomass is produced by
A) Fermentation. B) The Krebs cycle. C) Photosynthetic algae. D) Oxidation.
E) Anaerobic respiration.
- 4) The most common route of accidental AIDS transmission to health care workers is
A) Needlestick. B) Mouth to mouth. C) Fecal—oral.
D) Environmental surface contact. E) Aerosol.
- 5) What will happen if a bacterial cell is placed in distilled water with lysozyme?
A) The cell will undergo osmotic lysis. B) No change will result; the solution is isotonic.
C) The cell will plasmolyze. D) Water will leave the cell.
E) Lysozyme will diffuse into the cell.
- 6) *Legionella* is transmitted by
A) Vectors. B) Foodborne transmission. C) Person-to-person contact. D) Fomites.
E) Airborne transmission.
- 7) Which of the following causes an infection of the liver?
A) *Escherichia* B) Hepatitis A virus C) *Vibrio* D) *Shigella* E) *Salmonella*
- 8) Which of the following lacks a cell wall?
A) *Clostridium* B) *Mycobacterium* C) *Mycoplasma* D) *Borrelia* E) *Nocardia*
- 9) During which growth phase will gram-positive bacteria be most susceptible to penicillin?
A) Lag phase B) Log phase C) Stationary phase D) Death phase
E) The culture is equally susceptible during all phases.
- 10) You have isolated a motile, gram-positive cell with no visible nucleus. You can safely assume that the cell
A) Has a cell wall. B) Lives in an extreme environment. C) Has a mitochondrion.
D) Has 9 pairs + 2 flagella. E) Has a nucleus.
- 11) The definition of lysogeny is
A) Lysis of the host cell due to a phage. B) Phage DNA is incorporated into host cell DNA.
C) When the burst time takes an unusually long time. D) The period during replication when virions are not present. E) Attachment of a phage to a cell.
- 12) The etiologic agent of chickenpox is
A) Herpes zoster. B) Poxvirus. C) Parvovirus. D) HHV-6. E) Herpes simplex.

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- 13) Which of the following is **NOT** a chemical component of a bacterial cell wall?
A) N-acetylmuramic acid B) Cellulose C) Teichoic acids D) Peptidoglycan
E) Peptide chains
- 14) Treatment for tetanus in an unimmunized person with a puncture wound is
A) Tetanus immune globulin. B) Penicillin. C) Tetanus toxoid. D) DTaP.
E) Debridement.
- 15) Which of the following structures is **NOT** found in prokaryotic cells?
A) Axial filament B) Flagellum C) Pilus D) Cilium E) Peritrichous flagella
- 16) *Escherichia coli* belongs to the
A) Spirochetes. B) Proteobacteria. C) Gram-positive bacteria. D) Green sulfur bacteria.
E) Actinomycetes.
- 17) You advise your pregnant friend to give her cat away because
A) She could get listeriosis.
B) She could contract plague.
C) She could give the cat tularemia.
D) She could get toxoplasmosis.
E) She could get salmonellosis
- 18) In which of the following animals would you expect to find a specialized organ that holds cellulose-degrading bacteria and fungi?
A) Human B) Wolf C) Cat D) Dog E) Termite
- 19) Cyanobacteria are a type of
A) Chemoheterotroph. B) Photoautotroph. C) Photoheterotroph. D) Chemoautotroph.
E) Auxotroph
- 20) Assume the two *E. coli* strains shown below are allowed to conjugate.
Hfr: pro⁺, arg⁺, his⁺, lys⁺, met⁺, ampicillin-sensitive
F: pro⁻, arg⁻, his⁻, lys⁻, met⁻, ampicillin-resistant
What supplements would you add to glucose minimal salts agar to select for a recombinant cell that is lys⁺, arg⁺, amp-resistant?
A) Lysine arginine
B) Ampicillin, proline, histidine, lysine
C) Proline, histidine, methionine
D) Ampicillin, lysine, arginine
E) Ampicillin, proline, histidine, methionine
- 21) The source of nutrients in nutrient agar is
A) Peptone and beef extract. B) Peptone and NaCl. C) Nutrient. D) Agar.
E) Distilled water.
- 22) Which of the following is **NOT** a communicable disease?
A) AIDS B) Tetanus C) Malaria D) Typhoid fever E) Tuberculosis

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23) What type of immunity results from vaccination?

- A) Innate immunity
- B) Naturally acquired active immunity
- C) Naturally acquired passive immunity
- D) Artificially acquired active immunity
- E) Artificially acquired passive immunity

24) The bacteria contributing most of the bacterial biomass to soil are

- A) Actinomycetes. B) Photoheterotrophs. C) Chemoautotrophs. D) Coliforms.
- E) Rhizobiaceae.

25) In the presence of penicillin, a cell dies because

- A) It lacks a cell membrane. B) It lacks flagella. C) It plasmolyzes.
- D) It undergoes osmotic lysis. E) Its proteins had been denatured.

二、問答題 50%

1. 請詳細列出革蘭氏染色的步驟與細胞顏色變化（包括陽性菌與陰性菌）。（20%）
2. 敘述一個 (+) sense RNA 病毒的繁殖過程，請繪圖輔助說明。（15%）
3. 請畫出一個細菌的 growth curve，並註明各階段的英文名稱及 X-軸和 Y-軸的單位。（15%）