

## 單選題（每題二分，答錯不倒扣）

- The fish pathogen *Vibrio anguillarum* is isolated from the ocean, what is the possible incubation temperature.  
(A) 14°C  
(B) 20°C  
(C) 28°C  
(D) 37°C
- Vibrio anguillarum* is one of the most important pathogens causing vibriosis in many species of marine fish, it is a \_\_\_\_\_ bacterium.  
(A) Gram-positive  
(B) Gram-negative  
(C) Gram-neutral  
(D) Non-Gram
- We can use what chemical to prepare competent cells.  
(A) CsCl  
(B) CaCl<sub>2</sub>  
(C) HCl  
(D) DMSO
- What temperature for *E. coli* could obtain the best incubation?  
(A) 14°C  
(B) 20°C  
(C) 28°C  
(D) 37°C
- If you obtained a bacterium from the ocean, the culture medium should be added what's salt concentrations.  
(A) no NaCl  
(B) 1-3% NaCl  
(C) 5-10% NaCl  
(D) 15-20% NaCl
- Traditionally, which group of organisms is not usually included in microbiology?  
(A) plantae  
(B) viruses  
(C) bacteria  
(D) protozoa
- This inoculating tool spills the inoculum into the media being inoculated.  
(A) loop  
(B) pipette  
(C) swab  
(D) needle

(背面仍有題目,請繼續作答)

8. The following characteristics apply to an initially isolated pure colony except:
- (A) descendants of a single cell
  - (B) not touching another colony
  - (C) subculture a pure culture
  - (D) form a visible clump of growth
9. In order to perceive a microbe macroscopically, a cell must first be:
- (A) multiplied
  - (B) streaked
  - (C) colored
  - (D) enlarged
10. This reduced broth is made slightly viscous to impede motility and is also used to ascertain oxygen requirements.
- (A) semisolid medium
  - (B) solid medium
  - (C) gelatin stab
  - (D) fluid thioglycollate
11. Conventional terms used to specify growth media include all of the following except:
- (A) semisolid vs nonsemisolid
  - (B) synthetic vs nonsynthetic
  - (C) differential vs selective
  - (D) liquid vs solid
12. At room temperature semisolid media most closely resembles:
- (A) salad dressing
  - (B) bread, toast
  - (C) jam, Jello
  - (D) hamburger patty
13. Agar is not obtained from:
- (A) Gelidium
  - (B) red algae
  - (C) seaweed
  - (D) petroleum
14. In a 1%-5% agar nutrient media, all of the following properties apply except:
- (A) solid at room temperature
  - (B) constitutes a liquid media
  - (C) firm at incubation temperatures
  - (D) not digested by most microbes
15. Live hosts are essential for studies of:
- (A) viruses
  - (B) drug therapy
  - (C) syphilis & leprosy agents
  - (D) all of these

16. Although amino acids are present in all media, which one of the following is not considered a nonsynthetic media?
- (A) yeast in sugar solution
  - (B) minced plants, soybean digests
  - (C) specific amino acids
  - (D) peptone, milk, blood
17. This selective medium can isolate fungi because the pH 5.6 acidity inhibits most extraneous bacteria.
- (A) Sabouraud's agar
  - (B) MacConkey agar
  - (C) Lowenstein-Jensen agar
  - (D) tomato juice agar
18. The selective reagent common to both MacConkey and Salmonella-Shigella (SS) agar is:
- (A) bile salt
  - (B) acid, pH 5.6
  - (C) malachite green dye
  - (D) crystal violet
19. Pick the oxygen-consuming agent/s in selective media:
- (A) methylene blue
  - (B) phenol red
  - (C) spirit blue
  - (D) thioglycollate, cystine
20. The chief purpose of incubation is to:
- (A) allow bacteria to self-destruct
  - (B) arrest fermentation
  - (C) promote multiplication
  - (D) stain subcultures
21. Which of the following description of ascomycetous genus *Cordyceps* are true?
- (A) entomopathogenic fungus
  - (B) insect control
  - (C) antitumor and antioxidant in *C. sinensis*
  - (D) all of these
22. Which of the following description of piscine nodaviruses are not true?
- (A) enveloped
  - (B) a member of the *Betanodaviridae* family
  - (C) icosahedral capsids
  - (D) the genome is composed of bipartite, single-stranded RNA molecules
23. Unneeded cultures are best autoclaved or arrested by:
- (A) refrigeration
  - (B) inoculation
  - (C) incineration
  - (D) incubation

(背面仍有題目,請繼續作答)

24. The preparation of a secondary (or subsequent) culture from the original is called:
- (A) isolation
  - (B) subculture
  - (C) incubation
  - (D) inoculation
25. An axenic culture is another term for a \_\_\_ culture.
- (A) liquid (broth)
  - (B) contaminated
  - (C) mixed
  - (D) pure

簡答題 (每題五分)

1. What is the virus?
2. The *lac* operon is the important model for the gene regulation. Please explain what is the gene organization and regulation on the *lac* operon.
3. Please describe and explain an example of protein expression systems that is regulated by using the *lac* operon.
4. Please explain what is the reverse transcription-polymerase chain reaction (RT-PCR)?
5. Please explain which material could be detected by RT-PCR?
6. Please explain why you could be cloning the gene in eukaryotic cells by cDNA, but not by genomic DNA?
7. Please draw and explain what is the immunoblotting assay?
8. Please explain which material could be detected by immunoblotting assay?
9. Please explain what are the different in cell wall structure between Gram-positive and Gram-negative bacteria?
10. Please explain what are the Koch's postulates?