

I. Please choose the fittest answer to complete the sentence in each question. (60%)

1. () Do you think ____ is easier than to act?
(A) talking (B) about to talk (C) of taking (D) to talk
2. () I am not sure of ____ the table.
(A) where putting (B) where being put (C) where to put (D) where to be put
3. () Here almost everyone has a lap-top, ____ a mobile.
(A) to say nothing of (B) not to speak (C) to speak nothing of (D) no more to say
4. () Maria studies harder than ____ at that corner.
(A) the boy who seated (B) the boy is seated (C) is the boy seated (D) does the boy seat
5. () They seemed ____ for hours when we met them yesterday.
(A) that they had walked (B) that they walked (C) to have walked (D) as if had walked
6. () He is ____ young ____ school.
(A) too, for go to (B) so, to go to (C) too, to go to (D) too, to going to
7. () He is given to pleasure = He does nothing but ____ pleasure.
(A) pursue (B) to pursue (C) deny (D) denying
8. () All the spectators desired nothing but ____ an exciting game.
(A) there being (B) there be (C) there is (D) there to be
9. () Flattery cannot help ____ your end.
(A) to gaining (B) gain (C) gaining (D) for gaining
10. () This plan is sure ____.
(A) to fail (B) of failing (C) of failure (D) to be failed
11. () Any ____ person may apply for this position.
(A) interest (B) interesting (C) interested (D) interests
12. () I am tired of eating ____.
(A) freezing meat (B) boiling egg (C) can fish (D) fried potatoes
13. () The watch ____ to May is very expensive.
(A) which is belonged (B) belonging (C) belonged (D) belongs
14. () There stood a lime tree ____ with apples fresh and wet with dew.
(A) to load (B) loading (C) being loaded (D) loaded
15. () They returned ____.
(A) to defeat (B) to defeating (C) defeating (D) defeated
16. () The accused ____ of trespassing on privacy.
(A) stood accused (B) to stand accused (C) stood accusing (D) of standing accusing
17. () She seemed ____ at my question.
(A) annoy (B) annoying (C) to annoy (D) annoyed
18. () I saw the key ____ here this morning.
(A) laying (B) laid (C) lain (D) having laid
19. () As he entered the room, he found many books ____ scattered on the floor.
(A) laying (B) to lay (C) lying (D) lie
20. () A thief slipped in ____ and caught on the very spot.
(A) observing (B) observed (C) unobserving (D) unobserved
21. () ____ being a fine day last Sunday, we went mountain climbing.
(A) For (B) It (C) As (D) The weather

22. () Everyone ____, the dinner began.
(A) was seated (B) seated (C) were seated (D) sat
23. () Ginna plays tennis so well that, ____ the proper training, she may well become a creditable professional.
(A) give (B) she is given (C) giving (D) given
24. () My shoes ____ worn out, I had to buy a new pair.
(A) was (B) has been (C) having (D) being
25. () As a desert is like a sea, ____ a camel like a ship.
(A) and the same as (B) so does (C) so that (D) so is
26. () I know a better doctor than does Sam.
(A) The doctor I know is better than Sam
(B) Sam knows a doctor who is better than I am
(C) Sam knows a doctor who is better than himself
(D) The doctor I know is better than the doctor Sam knows
27. () We could hardly help our tears.
(A) If we could help it, we would not burst out laughing
(B) We were not in a position to shed tears
(C) We shed tears in spite of ourselves
(D) We helped ourselves to tears
28. () He cannot speak English, not to mention German.
(A) He can speak either English or German
(B) He can speak neither English nor German
(C) He can speak both English and German
(D) He can speak not English but German
29. () She is a graduate student, but her scholarship is not good enough, not to speak of practical experience.
(A) For all her scanty scholarship, she is a good mixer
(B) She is fresh from school
(C) Her practical experience is nothing to speak of
(D) We do not have the slightest idea of her practical experience
30. () Our business is too great a success not to excite envy in the rivals.
(A) The rivals will be pleased to hear our exciting success
(B) Our successful business will leave the rivals cold
(C) The rivals will think lightly of our success in business
(D) The rivals are sure to be jealous of our success

II. Please choose the most appropriate answer from the word bank for each blank in the essay.
(20%)

[Word Bank .]

(1) a very unequal business (2) brain drain (3) ethical recruitment policies (4) global health budget (5) key (6) lack (7) shortages (8) stark (9) struggling to cope (10) train more staff

The statistics in the World Health report are (31). The continents of North and South America have just ten per cent of the world's burden of disease but thirty-seven per cent of the world's health workers, and spend over fifty per cent of the total (32). The continent of Africa has twenty-four per cent of the world's disease, just three per cent of the world's health workers and less than one per cent of the budget.

Access to health care is (33). Of the fifty-seven countries which (34) health workers, thirty-six of them are in sub-Saharan Africa, the very same countries which are (35) with the AIDS epidemic.

The World Health Organization says the (36) are undermining not just the battle against deadly diseases like AIDS, tuberculosis and malaria; they're affecting childhood vaccination campaigns and basic care for pregnant women.

The reasons for the shortages are many, but money is (37). Rich countries need more doctors and nurses too, and salaries are higher than in Africa. The WHO says developing countries are suffering a (38) of health professionals.

The report calls for (39) for migrant health workers and international investment to help poor countries (40) because at the moment the world is short of four-million health workers and one-point-three-billion people lack even the most basic health care.

III. Composition: write about the work of the world, the people who do it, and things that are worth doing well (20%).

一、問答題：以下每題內有兩個問題，請選擇其中之一回答。

1. 請將 forearm 或 thigh 的肌肉分區，試述每區的肌肉組成、其主要功能及神經支配。(12%)
2. 試述 axillary artery 或 internal pudendal artery 的分支及每條分枝的供應區域。(12%)
3. 試述 brachial plexus 或 lumbar plexus 所發出的神經及其功能。(12%)
4. 試述交感或副交感神經系統的組成及功能。(12%)
5. 試述眼睛或耳朵的構造。(12%)
6. 試述胃或腎臟的結構及動脈供應。(10%)
7. 試述 orbital cavity 或 nasal cavity 的骨骼組成。(9%)

二、解釋名詞 (每題三分)

1. Spermatic cord
2. Broad ligament
3. Paranasal sinus
4. Urogenital diaphragm
5. Pelvis girdle
6. Lesser omentum
7. Bronchopulmonary segment

選擇題，請選一答案，每題2分。

- () 1. 細胞內包器具雙層膜？ (A) 平滑性內質網 (B) 高爾基體 (C) 中心體 (D) 粒線體
- () 2. 核糖體合成與組裝的場所？ (A) 高爾基體 (B) 細胞質 (C) 核質 (D) 核仁
- () 3. 細胞內骨架何者是最穩定(單體聚合後不易分解)的？ (A) 微細絲 (B) 中間細絲 (C) 微小管 (D) A, B, C 3者無差異
- () 4. 基本組織中單位面積細胞核密度最少？ (A) 上皮組織 (B) 結締組織 (C) 肌肉組織 (D) 神經組織
- () 5. 上皮組織如基底層是方形細胞，其上為方形細胞則稱____上皮。 (A) 複層鱗形 (B) 簡單鱗形 (C) 複層方形 (D) 簡單方形
- () 6. 排列於胸腔壁層的上皮？ (A) 單層方形 (B) 單層柱形 (C) 單層扁形 (D) 偽複層柱形
- () 7. 排列於輸尿管管腔的上皮？ (A) 偽複層柱形 (B) 簡單柱形 (C) 簡單扁形 (D) 移行上皮
- () 8. 排列於陰道腔面的上皮？ (A) 複層柱形 (B) 複層方形 (C) 複層扁形 (D) 偽複層柱形
- () 9. 黏著小帶zonula adherens的細胞膜內側細胞質面，有何種主要細胞骨架附著？ (A) 微細絲 (B) 中間細絲 (C) 微小管 (D) 無細胞骨架
- () 10. 胰臟分泌，何種分泌方式？ (A) 部分洩出的 (B) 頂端洩出的 (C) 全洩出的 (D) B + C
- () 11. 蜂窩組織 (areolar tissue) 的纖維主要是由下列何者分泌？ (A) 脂肪細胞 (B) 肥大細胞 (C) 巨噬細胞 (D) 成纖維細胞
- () 12. connexon 是屬於下列何者的一部份？ (A) tight junctions (B) desmosome (C) gap junctions (D) microvilli.
- () 13. 杯狀細胞主要分泌物？ (A) 酵素 (B) 抗體 (C) 組織胺 histamine (D) 黏液
- () 14. 肌肉組織中受傷後何者再生能力最差？ (A) 骨骼肌 (B) 平滑肌 (C) 心肌 (D) A, B, C 3者無差異
- () 15. 骨髓(bone marrow)內主要的結締組織？ (A) 蜂窩組織 (B) 網狀組織 (C) 骨組織 (D) 軟骨組織
- () 16. 椎間盤主要的軟骨？ (A) 透明軟骨 (B) 彈性軟骨 (C) 纖維軟骨 (D) A, B 2者混合
- () 17. 肌肉組織中何者具天生節奏性收縮？ (A) 骨骼肌 (B) 平滑肌 (C) 心肌 (D) A, B, C 3者皆無
- () 18. 皮膚內細胞表面具半橋粒(hemidesmosome)？ (A) 基底層 (B) 棘狀層 (C) 顆粒層 (D) 透明層
- () 19. 皮膚內何種細胞最多？ (A) 角質細胞 (B) 色素細胞 (C) 蘭氏細胞 (D) 美格爾氏細胞
- () 20. 嗅覺神經元是屬於？ (A) 偽單極神經元 (B) 雙極神經元 (C) 多極神經元 (D) 混合極神經元
- () 21. 肌細胞聚集成束，其外包圍的結締組織稱為 (A) 肌內膜 (B) 肌束膜 (C) 肌外膜 (D) 外束膜。

- () 22. 下列敘述何者錯誤？(A) 髓鞘就是軸突膜 axolemma (B) 髓鞘可由許旺氏細胞形成 (C) 髓鞘可由寡突細胞形成 (D) 髓鞘是「非細胞」的組織
- () 23. 形成血腦屏障一部分的細胞？(A) 寡突細胞 (B) 微小膠細胞 (C) 星狀細胞 (D) 室管膜細胞
- () 24. 骨髓切片中唯一不存在？(A) 淋巴管 (B) 哈維氏管 (C) 佛克曼氏管 (D) 骨板
- () 25. 中樞神經的白質中唯一不存在？(A) neuron cell bodies (B) neuroglia (C) myelin (D) thick axons
- () 26. 動作電位始於？(A) synapses (B) dendrites (C) telodendria (D) axon hillock
- () 27. 細胞質中無任何granules的是：(A) basophils (B) lymphocytes (C) eosinophils (D) neutrophils
- () 28. 下列何者分泌最多antibodies？(A) B 淋巴球 B lymphocytes (B) T 淋巴球 T lymphocytes (C) macrophages (D) plasma cells
- () 29. 骨髓中存在的大型細胞其功能與血液形成無關？(A) blood stem cells (B) reticulocytes (C) fat cells (D) proerythroblasts
- () 30. 下列何者形成macrophages？(A) erythrocytes (B) platelets (C) lymphocytes (D) monocytes
- () 31. Sarcoplasmic reticulum 是指那一個胞器？(A) plasma membrane (B) T tubules (C) sarcolemma (D) smooth endoplasmic reticulum
- () 32. 免疫系統內哪種細胞最先被 AIDS 病毒攻擊？(A) B 淋巴球 (B) 毒殺性 T 淋巴球 (cytotoxic T lymphocyte) (C) 輔助型 T 淋巴球 (helper T lymphocyte) (D) 輔助型 B 淋巴球 (helper B lymphocyte)
- () 33. 下列哪一種成分在正常的狀態下不會出現在淋巴液中？(A) 組織液 (B) 組織液內的蛋白質 (C) 腫瘤細胞 (D) 紅血球
- () 34. 微淋管 lymphatic capillaries 的通透性比微血管？(A) 高 (B) 低 (C) 相似 (D) 完全不通透
- () 35. 遠端小腸壁內聚集的淋巴小結 (follicles) 稱為？(A) 胰島 (pancreatic islets) (B) 培氏斑 (Peyer's patches) (C) rugae (折皺) (D) villi (絨毛)

問答題，每題15分。

1. 骨骼肌的肌節(sarcomere)在光學與電子顯微鏡下的構造與特徵？
2. 腎臟功能基本單位的構造與特徵？

Describe the following items

1. WHO classification of Hodgkin's lymphoma.
2. Hereditary breast cancer
3. Osteonecrosis (Avascular Necrosis)
4. MEN (multiple endocrine neoplasia)
5. Olfactory neuroblastoma
6. GIST (gastrointestinal stromal tumor)
7. Chronic granulomatous inflammation
8. Disseminated intravascular coagulation
9. AIDS-defining opportunistic infections and neoplasms found in patients with HIV . infection
10. Infective endocarditis.

infection
↑

作答順序不拘，但要記明題號

1. 請列出四種由土壤傳播之人體寄生蟲(Soil-transmitted parasites)，並從其中選出一種寄生蟲敘述其生活史。(20%)
2. 請述瘧原蟲(*Plasmodium*)感染人體時，引起的臨床症狀與造成的病害。(20%)
3. 請述會感染人體之三種血吸蟲(Schistosomes)世界地理分佈及鑑別診斷。(20%)
4. 請繪圖說明有鉤條蟲(*Taenia solium*)與無鉤條蟲(*Taenia saginata*)成蟲時期型態上不同處。(20%)
5. 簡述人體感染下列寄生蟲時之診斷，含 a. 採檢之檢體，b. 檢查方法，c. 可檢出之寄生蟲形態或發育期名稱。(20%，共 5 小題，每小題 4%)

作答範例：陰道滴蟲(*Trichomonas vaginalis*)

- a. 女性陰道之分泌物或男性攝護腺液
- b. 直接塗抹法或遠心沈澱法
- c. 檢查該蟲之營養型蟲體(trophozoite form)

題目

- | | |
|--------------------------------------------|------|
| (5-1) 蟯蟲(<i>Enterobius vermicularis</i>) | (4%) |
| (5-2) 蛔蟲(<i>Ascaris lumbricoides</i>) | (4%) |
| (5-3) 中華肝吸蟲(<i>Clonorchis sinensis</i>) | (4%) |
| (5-4) 肺孢子蟲(<i>Pneumocystis carinii</i>) | (4%) |
| (5-5) 瘧原蟲(<i>Plasmodium</i> spp) | (4%) |

問答每題 10 分

1. Antigen-presenting cell 有那七種?
2. Molecular diagnosis of microbial genetic material 有那十種方法?
3. Bacterial virulence mechanism 有那十種?
4. 抑制細菌合成蛋白質的抗生素有那六種? 抑制合成核酸抗生素有那四種?
5. 經由食物傳染的細菌病原有那十種?
6. 台灣常用的病毒疫苗有那十種?
7. 性開放和現代高發生率的那些癌症有密切關係?
8. 為何 Measles vaccine 效果 95% 而至今仍每年死亡超過 100 萬人?
9. 請問台灣 2002 年十大法定傳染病是什麼?
10. 請問近 20 年新發現傳染病原有那十種?

問答題

1. 試述 Disseminated Intravascular Coagulopathy (DIC) (15%)
2. 試述病毒之血清學檢驗方法(15%)
3. 急性心肌梗塞之臨床檢驗(15%)
4. 試述 TB(Tuberculosis) 之臨床檢驗(15%)
5. 試述檢驗室之品質管制(15%)
6. 試述多發性骨髓瘤(multiple myeloma)之臨床檢驗(15%)
7. 試述藥物濫用之臨床檢驗(10%)

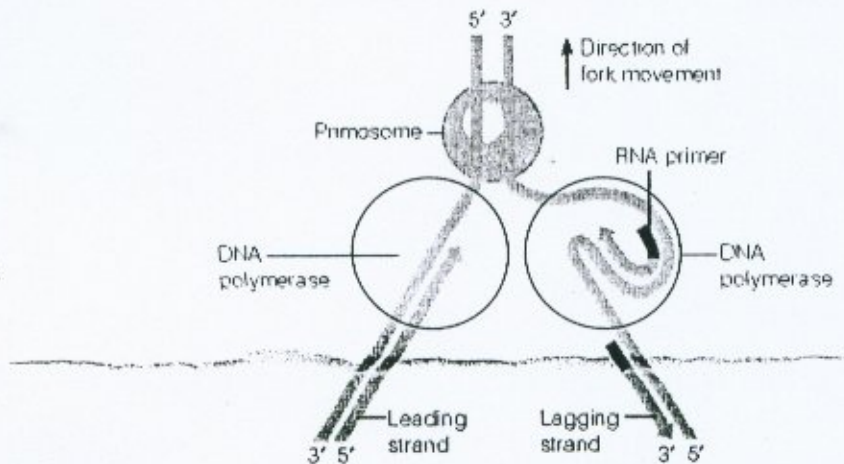
1. Please explain why genetic studies are important for modern medicine. You can use examples to help your explanation.
2. Please illustrate the impact of Human Genome Project on the modern society. You can discuss the impact from different points of view such as basic research, clinical practice, pharmaceutical industrial and ethical issues.
3. Please describe the difference between Mendelian diseases and complex genetic diseases.
4. Please tell us what your characters are to make you suitable to study genetics in the future.
5. If human can be cloned, do you think we can make an exactly identical person whose DNA is used for cloning. Please explain the reasons to support your opinion.

共 2 頁

Q & A (1-9, short answer questions; 10-14, regular questions)

1. In 1953, Watson and Crick published a DNA structure paper in Nature. There are three main points have been pointed out in the paper, what are they? (6%)
2. What are the mechanisms of excision repair and light-induced repair? (4%)
3. Compare post-transcriptional modification and post-translational modification. (6%)
4. Compare the regulation mechanism of Lac and Trp operon. (6%)
5. In phage λ biology, the programs for the lysogenic and lytic pathways are in a delicate balance of Cro and CI proteins. (6%)
 - (1) How do these two proteins interplay?
 - (2) How are $P_{L}O_L$, $P_{R}O_R$, $P_{R}M$ and $P_{R}E$ involved to determine the host will enter the lytic or lysogenic cycle?
6. Describe the function of the following elements on a plasmid vector such as pBluescript SK(+/-). (8%; each 2%)
 - A) ampicillin-resistance gene
 - B) lacZ gene
 - C) fl (+) or (-) origin
 - D) T7 and T3 promoters
7. Describe the principles of Sanger's method for DNA sequencing and automated DNA sequencing. (4%)
8. What are anti-sense RNA and RNAi? (5%)
9. Define genome and proteome. (5%)

10. Most of DNA and RNA in cells have different secondary structures (A, B, Z and H-DNA). Could you describe any possible interaction bonds exist? What give rise to drive B-DNA to A-DNA? Do A-DNA, Z-DNA and H-DNA show any significant physiological role? (10%)
11. As discussed by Arthur Kornberg of DNA replication, DNA polymerase III catalyzes DNA chain growth in only one 5'-3' direction as shown in figure. 1) How comes only one DNA polymerase III can recognizes both leading strand and lagging strand? 2) How could these two-strand complete their replication process at the same time? (10%)



12. What are the characteristics of genetic codon? (6 points) What is the wobble hypothesis? (10 %)
13. What does Real-time PCR stand for and use for? And why PCR product could be used in the TA cloning? (10%)
14. Several new techniques, including comparative genomics, immunoprecipitation, MS/MS, and Yeast Two-hybrid analysis, can identify protein-protein interaction. Please describe the principles of them. (10%)

1. 熱水器裝置不當易造成一氧化碳中毒(CO poisoning), 一氧化碳的主要毒性包括血液攜氧能力 (oxygen carrying capacity) 及細胞呼吸作用(cellular respiration)下降
- 請解釋 CO 造成上述毒性的作用機轉 (6分)
 - 抑制細胞呼吸作用會導致乳酸中毒(lactic acidosis), 請由細胞能量利用觀點解釋之(4分)
2. 由酵素反應的 K_m 值解釋為何能以 ethanol 治療 methanol poisoning (5分)
3. 比較“百米賽跑”與“坐在教室聽課”兩種狀況之下, 骨骼肌所需的 ATP 主要分別由何種代謝作用提供, 並解釋其理由(7分)
4. 欲探討不同脂肪酸組成的食用油對於肝臟 SREBPs(sterol regulatory element-binding proteins)基因表現之影響, 可應用那些方法研究 mRNA 量的變化, 並加以簡要描述(10分)
5. 說明 reverse cholesterol transport 在粥狀動脈硬化(atherosclerosis)的角色(6分)
6. 說明 IP3 參與的 signal transduction pathway (6分)
7. 比較參與細菌及人類 RNA 合成 (transcription) 之酵素的種類及功能(6分)

- 一、人體中血糖主要提供哪些器官之營養? 糖進入細胞後如何產生能量(包括有氧與無氧狀態)? (10%)
- 二、人體異化作用所產生之 ATP 主要維持哪些生理功能? 試舉例說明。(10%)
- 三、試述鈣 (calcium)、磷 (phosphorus) 在細胞內的重要功能。其在體液中之平衡如何受到荷爾蒙之調控?(需寫出涉及之荷爾蒙及器官)(10%)
- 四、體內細胞之間如何訊息傳遞?(10%)
- 五、雄性激素在作用組織(target tissue)如何作細胞內訊息傳遞, 因而產生了何種生理作用?(10%)