

English Test for Entrance Examination of Postgraduate Institute:(2 points for each question)

I. Please choose the fittest answer to complete the sentence in each question.

- ___1. The student raced out of the classroom and bumped ___ a teacher who was carrying a cup of coffee.
(A) into (B) at (C) to (D) on
- ___2. Ann says the party will be ____, so I suggest you wear a nice dress.
(A) familiar (B) formal (C) fluent (D) funny
- ___3. Nancy gained four kilograms during the holidays, so she decided to go ___ a diet.
(A) on (B) to (C) in (D) up
- ___4. Don't follow that car too ____. If it stops quickly, there could be an accident.
(A) directly (B) exactly (C) nearly (D) closely
- ___5. After we ate the fried chicken, our fingers were oily, so we asked the waitress for more
(A) napkins (B) packages (C) orders (D) menus
- ___6. The sea ___ seventy-five percent of the surface of our world.
(A) making up (B) makes up (C) make up what is (D) which makes up
- ___7. A laser beam ___ a concentration of pure light.
(A) consists of (B) which consists of (C) exhibiting (D) exhibit
- ___8. The universe ___ we know it might have begun with a great explosion.
(A) as (B) that (C) and which (D) and
- ___9. The bus was full, but Judy saw an empty seat next to an old woman. "___ I sit here?" she asked her.
(A) Should (B) Would (C) May (D) Will
- ___10. Mr. Li teaches mathematics at a public high school in Kaohsiung. He ___ there since 1995.
(A) is (B) was (C) will be (D) has been
- ___11. Being a newcomer, Alice is ___ with the area.
(A) informative (B) unfamiliar (C) aware (D) confident
- ___12. Cars and motorcycles are ___ in this area; people can only walk around here.
(A) permitted (B) promoted (C) banned (D) favored
- ___13. From the window, we got a(n) ___ view of the mountains.
(A) breathtaking (B) chilly (C) excited (D) moral
- ___14. Despite losing the use of his legs and some use of his arms, the ___ boy managed to ski with the help of a special device.
(A) shy (B) scared (C) disabled (D) elegant
- ___15. Jeff's English had improved so ___ that everyone was surprised.
(A) gradually (B) critically (C) bitterly (D) dramatically
- ___16. The violent storm almost destroyed the area. People living there really ___ an ordeal.
(A) scored (B) dragged (C) resisted (D) underwent
- ___17. ___ computer use may not cause wrist injuries, it can still give you a headache or make your eyes dry.
(A) Once (B) When (C) While (D) Despite
- ___18. ___ he restrained himself from blurting out those hurtful words, his girlfriend would not have left.
(A) Because (B) Had (C) Should (D) When
- ___19. Einstein was Jewish, and in 1933 the Nazi government ___ his property and German citizenship.
(A) taken away (B) took away (C) has taken away (D) was taken away

20. The trash can, ___ with rejected term paper, sat in the corner of the dorm room.
(A) fill (B) to fill (C) filling (D) filled
21. Sleep and exercise are ___ health.
(A) in essence (B) essentially (C) essential to (D) essential for
22. He not only read the copy, but ___ on it.
(A) reported (B) apologized (C) regretted (D) commented
23. Mr. Anderson says that in many ways he ___ his success to his wife's support.
(A) owes (B) distributes (C) deceives (D) betrays
24. The spread of knowledge could be ___ by means of books.
(A) accomplished (B) defined (C) claimed (D) exported
25. If you abide by your promise, you will keep your promise _____.
(A) temporarily (B) periodically (C) permanently (D) unwillingly

II. Please choose the item that interprets best the sentence in each question.

26. Education has its fashion, and like all other fashions they come and go. This means that
(A) Education should make us fashionable
(B) Education is sometimes popular, sometimes unpopular
(C) Students study and leave school after some time
(D) Ideas on education change all the time
27. He isn't above lying when it suits his needs.
(A) He will lie when he feels it's necessary.
(B) He knows it is always necessary to tell the truth.
(C) He never lies even when it would benefit him to do so
(D) He usually lies down when he needs to rest.
28. People's interest in their health and their demand for various forms of medical care have enormously increased.
(A) People are taking more interest in their health than in medical care.
(B) People are taking more interest in their health but demanding less medical care.
(C) People are taking more interest in their health and demanding much more medical care.
(D) Medical care, drugs and hospital care grow more and more costly.
29. Primitive man was probably more concerned with fire as a source of warmth and as a means of cooking food than as a source of light.
(A) In the ancient times fire was used for getting warmth and cooking food rather than for getting light.
(B) Primitive man had nothing to do with light.
(C) In the ancient times the main use of fire was not for getting warmth and cooking food but for getting light.
(D) Primitive man regarded fire as the chief source of light.
30. A bookstore is the last place in the world I expect to meet you.
(A) I finally find you in a bookstore.
(B) If I want to meet you, I should go to a bookstore.
(C) I met you in a bookstore last time.
(D) It is impossible for us to meet in a bookstore.
31. Mr. Braun is a friend of mine whose profession is to advise or represent others in legal matters. Mr. Braun is
(A) a judge (B) a lawyer (C) a policeman (D) a guide
32. For the American masses their civilization is a canned food civilization, so that the house wives, instead of being pressed by domestic chores, have plenty of time for reading and social activities, but on the other hand, people must be content with uniform and unpalatable dishes.
(A) It seems that American housewives are pressed by the jobs of cooking and washing dishes, etc.
(B) American housewives scarcely spend time visiting old friends or doing a lot of reading.
(C) American housewives enjoy ready-made food very much.
(D) It seems that Americans can't enjoy delicious food.

33. A general feature of modern society is the gap that separates the adult from the young, and it is most painfully felt between parents and children. In this paragraph, we are talking about the gap between ____.
- (A) families (B) society (C) parents (D) generations
34. One should read the classics in winter, because then one's mind is more concentrated; read history in summer, because one has more time; read ancient philosophers in autumn, because they have such charming ideas; and read the collected works of later authors in spring, because the Nature is coming back to life. What kind of reading requires most concentration?
- (A) History (B) Modern writing. (C) The classics. (D) Philosophy.
35. It may be said that the problem in adult education seems to be not the piling up of facts but practice in thinking.
- (A) Education methods for adults and young people should differ.
(B) Adults do not seem to retain new facts.
(C) Adults seem to think more than young people
(D) Adult education should stress ability to think.

III. Please choose the most proper item for each blank in the essays.

ESSAY 1

Jane lived near the sea, and she often went down to the beach to sit on the sand. Being by the sea was like being in a different 36. In front of her was the deep blue water; it slowly moved 37 her and then moved away again. Sometimes it came up very quickly and then her feet were covered by the salty water. 38 her, soft white clouds continually floated across the pretty blue sky. Noisy white 39 were flying over her head as well. 40 they dived down suddenly to catch a fish, and then they flew right back up into the air. Jane often sat by the sea for hours to enjoy this special place.

- ___ 36. (A) way (B) part (C) lake (D) world
___ 37. (A) for (B) with (C) toward (D) from
___ 38. (A) Above (B) Ahead (C) Besides (D) Next
___ 39. (A) sands (B) birds (C) clouds (D) ships
___ 40. (A) Sometimes (B) Although (C) When (D) If

ESSAY 2

Champ is a young male chimpanzee. Recently, he did something that surprised scientists. The scientists had 41 some grapefruit in the sand, and only Champ knew where the grapefruit was. When the other chimps were in the area, however, Champ 42 that he did not know where the grapefruit was. Later, when the other chimps 43 Champ went right to the spot 44 the grapefruit was hidden, dug it up, and ate it. 45, Champ was able to make plans and trick his friends.

- ___ 41. (A) buried (B) eaten (C) grown (D) dug
___ 42. (A) realized (B) pretended (C) wondered (D) admitted
___ 43. (A) fell asleep (B) fall asleep (C) will fall asleep (D) are going to fall asleep
___ 44. (A) which (B) there (C) what (D) where
___ 45. (A) To the scientists' relief (B) Amazingly (C) To make matters worse (D) However

ESSAY 3

"Culture shock," according to specialists in intercultural studies, refers to the feelings which people 46 when they come into a new environment. 47 their studies, scientists have found that there are three stages of culture shock. In the first stage, the newcomers like their environment. Then, when the novelty 48, they begin to hate the people, the apartment, and everything 49 in their new environment. In the final stage of culture shock, the newcomers 50 their surroundings and, as a result, enjoy their life there.

- ___ 46. (A) experience (B) experiencing (C) experienced (D) to experience
___ 47. (A) Of (B) Despite (C) For (D) In
___ 48. (A) takes off (B) puts off (C) wears off (D) takes over
___ 49. (A) too (B) else (C) more (D) as
___ 50. (A) live with (B) appeal to (C) adjust to (D) escape from

解釋名詞 (10 %)

- A. glycosaminoglycan
- B. GM₁
- C. T_m of membrane
- D. HRE (hormone response element)

解釋下列物質之功能,角色 (10 %)

- A. chi sequence
- B. SINEs
- C. Okazaki fragment
- D. RNAi
- E. SOS response

簡答題 (80 %, 作答時專有名詞以英文書寫)

1. 同一反應在酵素催化之下及無酵素作用之下,那一項反應的性質受到改變 ? (3 %)

2. 某酵素遵守 Michaelis-Menten equation, 請利用下列其 V_o , [S] 數據估算此酵素之 K_m 值 (5 %)

V_o ($\mu\text{mole}/\text{min}$)	substrate added (mmole/L)
217	0.8
325	2
433	4
488	6
647	1000

- 3. 簡述人體內 amino acid 其碳骨架(carbon backbone)代謝的可能途徑 (5 %)
- 4. 變性蛋白質(denatured proteins)如何再逆回去原始蛋白質(native proteins)? 並寫出變性蛋白質與原始蛋白質性質上的相異性 (5 %)
- 5. 何謂 protein targeting ? (5 %)
- 6. 人體內 amino acid 其 amino group 代謝過程中的 NH_4^+ 主要以那兩種 amino acid 形式於血液中運輸 ? (2 %)

7. 人類主要儲存何種分子為其細胞能量來源？就結構觀點解釋不同分子其儲存量及氧化產生能量效益差異性之可能原因 (5%)
8. 何謂 pyruvate-alanine cycle？並闡述其生理意義 (5%)
9. 脂肪組織(adipose tissue)lipoprotein lipase 的 K_m 值高達心臟(heart)的 100 倍之多,解釋其生理意義 (5%)
10. 簡述飲食膽固醇(cholesterol)經腸道吸收至血液循環而進入肝臟的可能途徑若進入肝外組織則可能的途徑又為何？(6%)
11. 簡述一分子 acetyl-CoA 經檸檬酸循環(citric acid cycle)氧化生成水與二氧化碳過程中,能量生成的情形 (5%)
12. NADH 經"respiratory chain" 氧化並生成 ATP 的過程中,連結"electron transfer" 及"ATP 生成"的事件為何？(4%)
13. protein kinase 催化蛋白質磷酸化(protein phosphorylation)此反應可能於蛋白質的那些 amino acid 上進行？
並簡述一個包含 second messenger 及 protein phosphorylation 的訊息傳遞途徑 (signal transduction pathway) (7%)
14. 寫出參與大腸桿菌(E.coli) mismatch pair 過程之蛋白質及酵素 (5%)
15. 解釋 promoter 及 enhancer, 並描述決定 promoter sequence 之方法 (5%)
16. 簡述基因表現(gene expression)過程中,調解蛋白質(regulatory protein)的 protein-protein interaction 種類 (4%)
17. 何謂 trans fatty acid？對人體健康有何影響性？(4%)

問答題

試述細菌的遺傳物資相互交換方式有那三種? (15%)

2. 細菌的實驗診斷常用培養基有四種; 1) enrichment media, 2) supportive media, 3) selective media, 4) differential media, 試述其中之差異。(15%)
3. 細菌對抗生素發生抗藥性的機轉有多種, 試述常用的實驗診斷方法? (15%)
4. 簡答下列問題: (55%)
 - 1) Niacin test
 - 2) Potassium tellurite medium
 - 3) The Nagler test
 - 4) Kinyoun stain
 - 5) Gram-negative broth
 - 6) MacConkey sorbitol agar
 - 7) Germ tube test
 - 8) Oxidase test
 - 9) Bacitracin test
 - 10) ONPG test
 - 11) Oxidation-Reduction Potential

1. 利用 prostate specific antigen (PSA) 做為 prostate cancer 診斷之靈敏度為 90%，但是特異性只有 50%。(16%)
 - (A) 如何改善 PSA 臨床診斷之正確性？
 - (B) PSA 血清型式有那些？對測定之影響？
 2. 敘述與糖尿病有關的檢驗及其臨床應用。(12%)
 3. 比較正常人 CSF 及 serum protein electrophoresis pattern；那些是 CSF protein 電泳的特徵？這些特殊蛋白的來源是？(12%)
 4. 影響酵素反應速率的因素有那些？若要利用酵素反應進行酵素活性的測定，則如何選取酵素最適反應條件？(16%)
 5. 利用電泳法與免疫酵素法測定血清 CK-MB 的結果是否一致？若否同？(8%)
 6. 討論下列有關腎功能檢驗的優、缺點。(A) 血清尿素氮，(B)血清 creatinine，(C) creatinine clearance。(12%)
 7. 設計一個實驗步驟(protocol)進行血漿 lactate 的測定；包括病人的準備的收集、與檢驗的進行。(12%)
- 有關產前 Down syndrome 篩檢的檢驗有那些？如何判讀及其臨床應用之限制？(12%)

血液學考題(碩士班用)

1. 有位患者其血液檢驗結果為 RBC: 450×10^6 /mm Hb:12.0g/dl

Hct:40.5%，請計算其 RBC 的 MCV 和 MCHC.

2. 血片(Blood smear)染色中看到多染性現象(polychromasia)是由於

何者增加的結果? 有何臨床意義?

3. 何謂地中海貧血(Thalassemia)? α -thalassemia 和 β -thalassemia

兩者在基因病變有何不同? 實驗室如何做區別診斷?

4. 正常嗜中性白血球分葉數是多少? 當分葉數過多

(Hypersegmented neutrophil) 時, 常見於下列何種疾病?

(A) 嗜中性球過多症 (Neutrophilia) (B) Pelger-Huet 異常

(C) 巨球性貧血 (Megaloblastic anemia) (D) 骨髓生成不

良症候群 (MDS), 並請說明理由

5. 何謂類白血病反應(Leukemoid reaction)它與慢性骨髓性白血病

(CML)有何相似之處? 下列何種細胞化學染色可以用來區分兩者?

(A) 過氧化酶染色(Peroxidase stain)

(B) 過碘酸希夫染色(Periodic acid schiff stain)

(C) 鹼性磷酸酶染色(Alkaline phosphatase stain)

(D) 酸性磷酸酶染色(Acid phosphatase stain)

6. 何謂 Platelet aggregation test? 如何進行? 下列那一項檢查可以區分 Glanzmann's Thrombasthenia 及 Bernard-Soulier Syndrome? (A) bleeding time (B) thrombin 刺激血小板凝集試驗 (C) 流式細胞儀測定 GPV1 表面膜蛋白量 (D) Ristocetin 刺激血小板凝集試驗

7. PT(Prothrombin time) test 與 APTT(Activated partial thrombinplastin time) test 在凝固作用中代表何種意義?

當 PT 延長, 但其它的血液凝固篩檢試驗皆正常時, 最有可能是那一個凝固因子缺乏所造成?

8. 何謂 DIC (Disseminated intravascular coagulation)? 那些異常的血液凝固試驗結果最能反應 DIC 現象?

9. 何謂 INR (International normalized ratio)? 它的計算公式為何?

Prothrombin time 為什麼要用 INR 發報告?

血庫學考題

(一) 選擇題 (30%)

- () 1. 有關台灣的亞孟買血型
- (a) 常自認為 O 血型
 - (b) 約每 8000 個人有一個屬於這個血型
 - (c) 可引起父母及子女間 ABO 血型的不合
 - (d) 以上皆是
- () 2. A 血型的基因型為
- (a) AA, HH
 - (b) AO, hh
 - (c) AA, hh
 - (d) 以上皆是
- () 3. 有關國人的亞孟買血型下列那一項是錯誤的
- (a) 帶 A 基因者的 phenotype 為 O^A_{Hm}
 - (b) 輸血時一定要輸亞孟買血型的血
 - (c) 帶 A 基因者口水中有 A 及 H 抗原
 - (d) 帶 A 基因者血清中的 Anti-A 不明顯
- () 4. 最常見的輸血反應
- (a) 血管內溶血的輸血反應
 - (b) 血管外溶血的輸血反應
 - (c) 發燒反應
 - (d) 蕁麻疹反應
- () 5. 有關輸血相關的 GVHD
- (a) 病人有免疫缺乏症
 - (b) 病人的 HLA haplotype 為 homozygous, 而捐血人為 heterozygous
 - (c) 病人的 HLA haplotype 為 heterozygous, 而捐血人為 homozygous
 - (d) 在台灣常發生
- () 6. 引起發燒反應的輸血反應的原因
- (a) 病人白血球的抗體和捐血人的白血球反應
 - (b) 病人 HLA, granulocyte 或血小板的抗體與輸入的相關血球反應
 - (c) 血小板濃厚液中的白血球釋放出來的 Cytokines 引起的
 - (d) 以上皆是
- () 7. 有關 Miltenberger series 的血型
- (a) 在白種人為稀有血型
 - (b) 為 GPA 及 GPB (glycophorine A 及 B) 的 hybrid protein
 - (c) MiIII 為 GP. Mur
 - (d) 以上皆是
- () 8. 有關台灣的亞孟買血型
- (a) 是 H 基因發生 point mutation
 - (b) 是 A、B 或 O 基因發生 point mutation
 - (c) 是 Se gene 發生 point mutation
 - (d) 是 Le 基因發生 point mutation

9. 有關 MiIII 血型及 anti-'Mi^a'，下列哪一項是錯誤的
- (a) anti-'Mi^a' 為國人最常見到的不規則抗體
 - (b) anti-'Mi^a' 可引起新生兒溶血症
 - (c) anti-'Mi^a' 在台灣病人的頻率約為 0.05%
 - (d) 在阿美族、雅美族及卑南族 MiIII 血型的頻率是世界上最高的
10. 有關國人 Rh(D)陰性者下列那一項為錯誤的
- (a) anti-D 頻率低的原因是因 Rh 陰性者的頻率低，約 0.33%
 - (b) Rh 陰性不帶 anti-D 者可輸陽性的血
 - (c) Anti-D 引起的 perinatal death (hydrop fetalis) 在台灣約為 1/87000
 - (d) Anti-D 引起的輸血反應為血管外溶血
11. 下列那一項是不引起即時性血管內溶血的抗體
- (a) anti-A, anti-B
 - (b) anti-D
 - (c) anti-'Mi^a'
 - (d) anti-A, B
12. 下列有關發生在台灣輸血反應，那一項為錯誤的
- (a) 輸血反應的頻率約為 0.1%
 - (b) 90% 以上為非溶血性的輸血反應
 - (c) 輸血相關的呼吸窘迫症和捐血人的 granulocyte 抗體無關
 - (d) 非溶血性發燒反應可因病人白血球抗體引起
13. 一個 25 歲健康捐血人因車禍受傷，流血約 500ml，下列的治療那一項為正確
- (a) 輸全血 2 單位
 - (b) 輸紅血球濃厚液 2 單位
 - (c) 輸新鮮全血 2 單位
 - (d) 注射 normal saline 2 瓶
14. 有關去除白血球的紅血球，那一項為錯誤
- (a) 用洗滌法能去除約 99% 的白血球
 - (b) 高效能 leukocyte removal filter 可移除 99% 以上血袋中的白血球
 - (c) 用去白血球的紅血球可以避免 CMV 的感染
 - (d) 用去白血球的紅血球可減少非溶血性發燒反應的發生
15. 自體輸血的好處有那一項為錯誤
- (a) 可避免 HIV 的感染
 - (b) 可避免肝炎病毒的感染
 - (c) 可避免因輸他人血而引起的免疫能力的下降
 - (d) 可避免敗血症

詳述適合台灣的輸血前配合試驗 (包括血型測定等) 20%

請寫出糞便潛血檢查之化學法及免疫法的原理，並分別列舉出化學法陽性、免疫法陰性，以及化學法陰性、免疫法陽性的可能原因。(20%)

2. 請由大至小依序繪出糞便中可檢出的十種蟲卵，並註明其名稱。(15%)
3. 請寫出 UF-100 全自動尿沈渣分析儀之檢測原理。(15%)
4. 請寫出尿液化學檢查及尿沈渣檢查可以相互對照的項目。(20%)

寄生蟲學部份 (佔 30%)

有一位病人血液檢查發現貧血，懷疑感染 *Strongyloides stercoralis*、*Ancylostoma duodenale*、*Necator americanus*、*Trichuris trichiura* 等寄生蟲，請問臨床鏡檢應如何從檢體做檢查及鑑別診斷？

在臨床鏡檢的專業知識如何做下列寄生蟲病人的鑑別診斷？

例：*Ascaris lumbricoides*：採集糞便以濃縮集卵法處理，

鏡檢大小約 $45 \times 55 \mu\text{m}$ ，見波浪狀蛋白膜金黃色的蟲卵。

- ① *Plasmodium falciparum*
- ② *Wuchereria bancrofti*
- ③ *Angiostrongylus cantonensis*
- ④ *Entamoeba histolytica* 的(cyst form)
- ⑤ *Hymenolepis nana*

病毒學部份 (佔 50%)

每題十分

1. 試述流感病毒之培養與鑑定。
2. 試述腸病毒之培養與鑑定。
3. 試述愛滋病毒之檢驗
4. 試述補體結合試驗之原理及其在病毒檢驗之應用。
5. 試述螢光抗體染色試驗之原理及其在病毒檢驗之應用。

臨床血清免疫學部份 (佔 50%)

請寫出五種利用不同光學原理來偵測抗原抗體反應的方法並加以說明(25分)

請比較並說明 complement, immunoglobulin, T cell receptor, class I 及 class II human leukocyte antigen 和抗原作用的異同 (25分)

生理學 (每題 10 分)。

1. 什麼是等張溶液(isotonic solution)? 有何生理意義?
2. 圖示一神經細胞的動作電位(action potential), 及离子移動的情形。
3. 什麼是血比容(Hct)? 血紅素(Hb)的含量有多少? RBC 有多少? 如何調節RBC的數目? 什麼是黃疸(jaundice)?
4. 什麼是壓力接受器反射(baroreceptor reflex), 其如何調節血壓?
5. 說明肺臟四個肺容積(lung volume)及四個肺容量(lung capacity)的定義。
6. 圖示胃酸分泌的過程。
7. 圖示近彎管(腎小管之 proximal convoluted tubule)分泌酸的過程。
8. 在女性性週期中, 試探討卵泡, 子宮內膜的週期變化。
9. 何謂單突觸反射(monosynaptic reflex, 如膝跳反射)?繪圖說明之。
10. 說明睡眠過程中, 腦波(EEG)的改變。