高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:國文　　考試時間: 80 分鐘　　共 4 頁

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液(帶)，未遵照正確作答方法而致無法判讀者，考生自行負責。
二、非選擇題限用黑色或藍色墨水之鋼筆、原子筆或鉛筆，在答案卷上作答。
三、試題、答案卷及答案卡必須繳回，不得攜出試場。

一、綜合測驗:(單選題，每題 2 分，共 60 分)

請選出一個最適當的選項，標示在答案卡上。答錯一題倒扣 0.5 分，倒扣至本大題 0 分為止；未作答者，不給分亦不扣分。

1. 下列文句中，有錯字的選項是：
(A) 這篇文章邏輯嚴謹，觀點獨到，在在顯示了作者的學力與識見
(B) 他為了掩飾自己的過失，絞盡腦汁，一味圓謊，終究還是露出破綻
(C) 商店貨架上陳列著林林總總的新款商品，真可謂琳琅滿目，讓人看得眼花撩亂
(D) 時下名歌手的現場演唱會，常不惜投下大筆的製作經費，以講求聲光效果，震撼視聽
(E) 為人處世，態度以謙和圓融為上。倘若心存驕矜，自恃甚高，總不免招來旁人的猜忌怨恨

2. 下列「　」中的詞語解說錯誤的選項是：
(A)「金風」送爽：秋風
(B) 玉兔「銀蟾」: 月亮
(C)「紫氣」東來：祥瑞之氣
(D)「碧血」丹心：志士的忠烈節義
(E) 布衣「白士」: 品行高潔的讀書人

3. 中國儒家學派宗奉的「十三經」，除了《周易》、《尚書》、《詩經》、三禮(《周禮》、《儀禮》、《禮記》)、三傳(《左傳》、《公羊》、《穀梁》)以及《論語》、《孟子》之外，還包括：
(A)《孝經》、《爾雅》
(B)《大學》、《中庸》
(C)《國語》、《戰國策》
(D)《大戴禮》、《山海經》
(E)《道德經》、《南華經》

4. 西漢史家司馬遷是《史記》的作者，下列相關敘述何者正確？
(A) 司馬遷繼承了父親司馬談的史官家業及職志
(B) 司馬遷年少時即遍遊大江南北，為的是考察旅遊地理
(C) 漢武帝任命司馬遷為史官，並下旨命其撰作《史記》
(D) 司馬遷受到李陵事件的牽連，銀鐺入獄，含恨而死
(E) 班固基於「瑜亮情結」的心理，對司馬遷多所批評

5. 東漢班固《漢書・藝文志》提出「九流十家」之說，其中「雜家」乃「兼儒、墨，合名、法」。下列著作何者為班固所謂的雜家？
(A)《管子》、《晏子》
(B)《荀子》、《春秋繁露》
(C)《公孫龍子》、《惠子》
(D)《呂氏春秋》、《淮南子》
(E) 以上皆非

6. 以下各段文字，何者對於人性最能抱持正面、樂觀的看法？
(A) 性相近也，習相遠也
(B) 人性之善也，猶水之就下也
(C) 富者，人之情性，所不學而俱欲者也，……終不餘力而讓財矣
(D) 夫民有血氣心知之性，而無哀樂喜怒之常，應感起物而動，然後心術形焉
(E) 上之性，就學而愈明；下之性，畏威而寡罪。是故上者可教，而下者可制也

7. 中國哲學在修養論上，可大別為「尊德性」及「道問學」兩種門路，二者亦近於「頓悟」與「漸修」。下列選項中，相關敘述何者不正確？
（A）君子居必擇鄉，遊必就士——此屬「尊德性」
（B）身是菩提樹，心如明鏡臺。時時勤拂拭，勿使惹塵埃——此屬「道問學」
（C）菩提本無樹，明鏡亦非臺。本來無一物，何處惹塵埃？——此屬「尊德性」
（D）譬如登山，人多要至高處。不知自低處不理會，終無至高處之理——此屬「道問學」
（E）只要解心。心明白，書自然融會；若心上不通，只要書上文義通，卻自生意見——此屬「尊德性」

8. 中國文學史上知名的「唐宋古文八大家」，包括韓愈、柳宗元、歐陽修、蘇洵、蘇軾、蘇轍以及：
（A）元稹、白居易　（B）范仲淹、司馬光　（C）王安石、曾鞏　（D）張載、程頤　（E）朱熹、陸游

9. 下列選項中，有關唐代詩人的敘述何者正確？
（A）王維有「詩佛」之稱，因為他晚年修道奉佛，其山水詩作時富禪趣
（B）李白有「詩仙」之稱，因為他性情倜儻不拘，作品風格飄逸奔放
（C）杜甫有「詩史」、「詩聖」之稱，因為他深具儒生情懷，詩作多關社會寫實，並且窮研格律，藝術造詣精妙
（D）白居易主張「文章合為時而著，歌詩合為事而作」，詩風平易自然，老嫗能解
（E）以上皆是

10. 今年間由作家白先勇製作推出的崑劇〈牡丹亭〉，原劇作者是：
（A）關漢卿　（B）馬致遠　（C）徐渭　（D）張岱　（E）湯顯祖

11. 下列記遊文學作品中，何者經常寓託作者懷才不遇的牢騷幽懷？
（A）楊衒之《洛陽伽藍記》　（B）酈道元《水經注》
（C）柳宗元〈永州八記〉　（D）蘇軾〈前、後赤壁賦〉
（E）徐宏祖《徐霞客遊記》

12. 曹丕〈典論論文〉的論點不包括：
（A）孔融體氣高妙，有過人者；然不能持論，理不勝辭
（B）奏議宜雅，書論宜理，銘誄尚實，辭賦欲麗
（C）常人貴近賤遠，向聲背實
（D）西伯幽而演易，周旦顯而制禮；不以隱約而弗務，不以康樂而加思
（E）蓋文章者，經國之大業，不朽之盛事

13. 有關《世說新語》，下列敘述何者正確？
（A）《世說新語》著墨於文人從個人生命的關注轉向政教的參與
（B）「吾本乘興而行，興盡而返」為王羲之的名言
（C）劉孝標好讀書，時人稱為「書淫」
（D）《世說新語》中的人物多拘於當時社會的禮法
（E）《世說新語》中以志怪筆記為主

14.「回首向來蕭瑟處，歸去，也無風雨也無晴」的名句，出自何人之手？
（A）柳永　（B）周邦彥　（C）蘇軾　（D）辛棄疾　（E）李清照

15. 關於元曲，下列敘述何者有誤？
（A）馬致遠、關漢卿、白樸與張可久合稱元曲四大家
（B）關漢卿＜竇娥冤＞對元雜劇及後世戲曲有深遠的影響
（C）張可久是元代散曲作品留存最多的作家
（D）「夕陽西下，斷腸人在天涯」是馬致遠的名句
（E）元曲可分為散曲和雜劇：散曲為詩歌；雜劇為戲劇，有情節、賓白、科介

16. 清代所遺留文獻中，成為後人了解原住民社會所必讀的書籍為：
（A）《台灣通史》　（B）《裨海紀遊》　（C）《台灣外記》　（D）《窺園留草》　（E）《半崧集》

17. 下列何者不是白先勇筆下的女性？
（A）尹雪豔　（B）王嬌蕊　（C）金大班　（D）玉卿嫂　（E）朱青

18. 以《蘭嶼行醫記》一書記錄在離島行醫的醫生作家是：
（A）侯文詠　（B）王溢嘉　（C）歐陽林　（D）莊裕安　（E）田雅各

19. 關於公文，下列敘述何者有誤？
（A）公務未決階段需要磋商、徵詢意見或通報時使用「書函」
（B）發布行政規章，發表人事任免、遷調、獎懲時使用「令」
（C）總統與立法院、監察院公文往復時使用「咨」
（D）幕僚對長官或下級機關首長對上級機關首長處理公務時表達意見，以供瞭解案情，並作抉擇依據時使用「呈」
（E）民眾與機關間的申請與答復可使用「函」

20. 在通候業師的書信格式中，下列何者不妥當？
（A）提稱語用「函丈」　（B）提稱語用「壇席」
（C）請安語用「恭請　誨安」　（D）自稱用「授業」
（E）署名下敬辭用「拜上」

21. 下列題辭，何者最適合醫院開業？
（A）月旦品評　（B）利濟民生　（C）功同良相　（D）斯文在茲　（E）明察天機

〈外物〉　莊子

莊周家貧，故往貸粟於監河侯。監河侯曰：「諾。我將得邑金，將貸子三百金，可乎？」莊周忿然作色曰：「周昨來，有中道而呼者。周顧視車轍中，有鮒魚焉。周問之曰：『鮒魚來！子何為者邪？』對曰：『我，東海之波臣也。君豈有斗升之水而活我哉？』周曰：『諾。我且南遊吳越之王，激西江之水而迎子，可乎？』鮒魚忿然作色曰：『吾失我常與，我無所處。吾得斗升之水然活耳，君乃言此，曾不如早索我於枯魚之肆！』」

22. 上述莊周對監河侯講鮒魚的故事，是諷刺監河侯不願意：
（A）見危致命　（B）宵衣旰食　（C）普渡眾生　（D）周急濟貧　（E）遊說國君

〈山市〉　蒲松齡

奐山山市，邑八景之一也，數年恒不一見。

孫公子禹年，與同人飲樓上，忽見山頭有孤塔聳起，高插青冥。相顧驚疑，念近中無此禪院。無何，見宮殿數十所，碧瓦飛甍，始悟為山市。未幾高垣睥睨，連亙六七里，居然城郭矣。中有樓若者、堂若者、坊若者，歷歷在目，以億萬計。忽大風起，塵氣莽莽然，城市依稀而已。既而風定天清，一切烏有；惟危樓一座，直接霄漢。樓五架窗扉皆洞開，一行有五點明處，樓外天也。層層指數：樓愈高則明漸小；數至八層、裁如星點，又其上則黯然縹緲，不可計其層次矣。而樓上人往來屑屑，或憑或立，不一狀。逾時樓漸低，可見其頂，又漸如常樓，又漸如高舍，倏忽如拳如豆，遂不可見。

又聞有早行者，見山上人煙市肆，與世無別，故又名「鬼市」云。

23. 關於蒲松齡「山市」，下列選項所述何者為非？
（A）即日光折射　（B）同海市蜃樓
（C）即山中雲海　（D）又名鬼市
（E）山市由地勢和氣候變化而形成

24. 《論語‧述而》：「子曰：『奢則不孫，儉則固；與其不孫也，寧固。』」關於該段文字之敘述，下列說明何者正確？
（A）「孫」通「遜」，指謙虛、禮讓；「固」謂擇善固執
（B）「與其不孫也，寧固」和「君子不重則不威，學則不固」的「固」字，二者意義相同
（C）「與其…寧…」是經過比較而有所選擇的句型，而「寧…」的狀態優於「與其…」
（D）由以上的敘述可知，「不孫」是不好的，而「固」是好的
（E）「與其不孫也，寧固」表示孔子標榜節儉的美德

25. 成語有其原發語境的本義與運用的衍生義，後世常用其衍生義而忘其本義，試問下列選項的說明，何者不是本義？
(A)「出爾反爾」：反覆無信，前後矛盾　(B)「峰回路轉」：山勢迴轉，山路蜿蜒曲折
(C)「難兄難弟」：稱人兄弟才學品德俱佳　(D)「水落石出」：冬初水位降低，河岸石塊顯露
(E)「牛山濯濯」：牛山草木因放牧與砍伐而光禿禿

26. 下列選項中，注音兩兩相同的是：
甲、識見卓「犖」/晶「瑩」剔透　乙、睥「睨」群雄/可知端「倪」
丙、「甕」牖繩樞/採摘「蘿」菜　丁、黃髮垂「髫」/千里「迢迢」
戊、順心「愜」意/擊劍任「俠」　己、不計輸「贏」/身體「羸」弱
庚、星輝斑「斕」/夜「闌」人靜
(A) 丁己庚　(B) 戊己庚　(C) 甲乙丙　(D) 丁戊庚　(E) 丙丁庚

27. 關於唐代傳奇的敘述，下列選項何者為非？
(A) 代表中國小說的初步成熟
(B) 與志怪在寫作目的上的區別是：開始有意創作小說
(C) 在題材上也較志怪更形豐富：如士妓戀愛、階級衝突等
(D) 道教、佛教的修煉、理念與奇特想像也為唐代傳奇所採用
(E) 發展到明代傳奇尤其達到高峰

28. 下列選項關於中國醫學史的敘述，何者錯誤？
(A) 所謂四診心法是指：望、聞、問、切，其中聞是指氣味
(B) 五臟與五行相配，其中肺屬金，心屬火
(C) 漢代最重要的兩位醫生為張仲景與華佗，前者著有《傷寒論》，後者精於方藥與外科手術
(D) 南宋宋慈著有《洗冤錄》，此書標誌著中國法醫學成立
(E) 金元四大家分別是：劉完素－寒涼派，張子和－攻下派，李東垣－補土派，朱丹溪－養陰派

29. 陶淵明〈讀山海經〉之九：「夸父誕宏志，乃與日逐走。俱至虞淵下，似若無勝負。神力既殊妙，傾河焉足有？餘迹寄鄧林，功竟在身後。」就上述所言，請判斷下列選項何者為非？
(A) 夸父是指巨人族　(B)「虞淵」是日升之處
(C) 陶淵明讚許夸父的作為，故說「誕宏志」　(D)「傾河」指夸父飲於河、渭，「鄧林」即樹林
(E) 陶淵明說夸父死後所化鄧林乃有功於世

30. 關於中國古典小說的敘述，下列選項何者為非？
(A)《西遊記》雖是以唐玄奘西天取經為主軸，但其實與道教的關係也相當密切
(B)《三國演義》忠實地反映再現《三國志》的內容
(C)《水滸傳》目前通行本是金聖嘆刪節後的七十回本，其中一百單八好漢，人人性格不同，最見作者筆力
(D)《金瓶梅》反映的是明代社會，其宗旨有人譽為具大乘精神
(E)《紅樓夢》是帶有自傳性色彩的清代小說，全書一百二十回，前八十回為曹霑所撰，後四十回為高鶚續

二、作文命題：四十分

作文題目：當代台灣醫療現象的省思

說明：1. 請抄題。
2. 字數不得少於五百字。
3. 須用新式標點符號。

高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:英文　　考試時間: 80 分鐘　　共 6 頁

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液（帶），未遵照正確作答方法而致無法判讀者，考生自行負責。
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三、試題、答案卷及答案卡必須繳回，不得攜出試場。

I. Structure: Please choose the best answer to complete the sentence. 20 points.

每題 2 分，共 10 題。答錯一題倒扣 0.67 分，倒扣至本大題零分為止。未作答者，不給分亦不扣分。

1. It was difficult for Catherine to see how anyone could believe such a _____ story.
(A) credible (B) dubious (C) curious (D) fundamental

2. Who wouldn't be _____ by such an offer? This new job would pay twice as much as I am making now.
(A) dismayed (B) nonplused (C) enticed (D) intensified

3. Simple and _____, the young man was always led into trouble, though he never intended to do wrong.
(A) skeptical (B) valiant (C) gullible (D) notorious

4. The young boy was crying because he got a _____ in his finger and his father was trying to pull it out.
(A) sore (B) splinter (C) scar (D) scrape

5. The playwright received rave reviews from critics, who called his writing _____.
(A) incomprehensible (B) preternatural (C) extravagant (D) ingenious

6. This box of _____ cookies from Denmark represents the finest flavors in Scandinavian baking.
(A) musty (B) assorted (C) exported (D) porous

7. Studies show that those constantly exposed to second-hand smoke are just as _____ lung disease as smokers are.
(A) susceptible to (B) concerned about (C) addicted to (D) aware of

8. His home is one of the most lavish in Taiwan, _____ many well-known Impressionist paintings and over fifty well-ornamented rooms.
(A) boasting (B) boasted (C) to boast (D) boasts

9. By the time we get to New York, we _____ almost 3,000 miles.
(A) will have been traveling (B) will travel
(C) will be traveling (D) will have traveled

10. Young and full of dreams and worries, Li-hui was grateful for her best friend Shelley, _____ she could confide.
(A) who (B) whom (C) whose (D) in whom

II. Cloze: Please choose the best answer to fill in the passage. 15 points.

每題 1 分，共 15 題。答錯一題倒扣 0.33 分，倒扣至本大題零分為止。未作答者，不給分亦不扣分。

When buying a gift for someone, one should keep in __11__ that person's likes and dislikes. Some people can never make up their minds about __12__ to buy. When they think they have finally decided __13__ something, they often change their minds.

11. (A) heart (B) mind (C) deed (D) memory
12. (A) what (B) that (C) who (D) how
13. (A) in (B) of (C) on (D) at

Technology has come a long way __14__ the time of Thomas Edison, inventor of the electric light bulb, the electric motor and the phonograph, __15__other things. Edison was also the main __16__ for the first commercial central power system in New York City. Today, nearly a century after Edison's most __17__ period of invention, with the __18__ of the Computer Age, many of the functions that Edison brought to life __19__ into __20__ mobile communication devices.

14. (A) before (B) since (C) because of (D) with respect to
15. (A) accompanied (B) added (C) among (D) with

16. (A) conductor (B) delegate (C) conspirator (D) mastermind
17. (A) rabid (B) seminal (C) estranged (D) superlative
18. (A) advent (B) initiation (C) sophistication (D) prosperity
19. (A) have compacted (B) are included (C) are being incorporated (D) are making
20. (A) radical (B) corporeal (C) surrogate (D) state-of-the-art

Experts have (21) aneurysms to time bombs for good reason: You can be symptomless until the faulty blood vessel bursts. The major arteries in the chest and head are the most notorious—and (22) —places to have an aneurysm; half of all (23) die immediately. People with high blood pressure, those who have high cholesterol, and those who smoke are the most likely to suffer. In rare cases, those with close relatives who have had aneurysms may also be at risk. Here are two pieces of advice from the experts: If you suspect a burst, go to a (24) neurosurgeon immediately. Second, if you are at risk for having an aneurysm, ask your doctor to do an MRI screening. The (25) is good for people who have aneurysms removed before they burst.

21. (A) designated (B) denoted (C) referred (D) likened
22. (A) stubborn (B) lethal (C) exacting (D) liable
23. (A) victims (B) survivors (C) deceased (D) casualty
24. (A) respiratory (B) psychiatric (C) vascular (D) endocrine
25. (A) prognosis (B) diagnosis (C) agnostic (D) monitor

III. Reading comprehension: Please select one best answer to each of the following questions which are based on the preceding passage. 45points

每題 1.5 分，共 30 題。答錯一題倒扣 0.5 分，倒扣至本大題零分為止。未作答者，不給分亦不扣分。

26. France, ignoring the worldwide protest and concern for the safety of mankind, conducted nuclear test in the South Pacific. Most people have got angry at the news.

Which do you think is the general idea of the public?
(A) Nuclear tests are safe for mankind.
(B) World opinion had no effect on France’s behavior.
(C) France gave up the tests in the South Pacific.
(D) The French love the South Pacific.

27. As Ken neared the top of the mountain, his heart beat faster in anticipation of the grand view awaiting him.

Why did Ken’s heart beat faster?
(A) He was getting very tired. (B) He was eager to see the surrounding land.
(C) The top of the mountain was very high. (D) The anticipation had no effect on him.

28. Throughout the world, engineers have been infamous for their general lack of concern for the environmental impact of their activities, and, consequently, they have contributed to the decline in the quality of our surroundings.

This means that _____.
(A) engineers should show less concern for the well-being of people and their environment to improve our lives.
(B) engineers should stop driving cars which pollute our environment to improve our lives.
(C) engineers should strive for a greater impact on their environment to improve our lives.
(D) engineers should be aware of and avoid designing sources of pollution to improve our lives.

29. In 1551, an English physician named Harvey published a book on the blood circulation. Although Harvey’s explanation was not universally accepted at the time, medical men of today credit him with one of the greatest advances in medical history.

This passage does not say anything about Harvey’s_____.
(A) reputation. (B) medical training. (C) field of research. (D) profession.

30. One drop of rain doesn’t make a shower and the performance of a single word or deed does no make a saint.

This means that_____.
(A) it is an ill wind that blows no body any good.
(B) one swallow does not make a summer.
(C) it never rains but it pours.
(D) there is no smoke without fire.

31. So far, no traffic accidents have been attributed to the missing street-light poles.
(A) Although some street-light poles are found missing, traffic accidents are not said to have had anything to do with it.
(B) Owing to traffic accidents, a few street-light poles are pulled up.
(C) A few street-light poles are attributed to traffic accidents. In other words, if there had been no traffic accidents, there would be no street-light poles.
(D) No sooner had the street-light poles been removed than traffic accidents happened in succession.

32. I would not have said it when she was there if I had thought that it would shock her.
(A) I regret that I said it to her face; it did shock her.
(B) I did not think she would mind what I said.
(C) What I said made her shocked, but it was quite without intention.
(D) To my regret, what I said did not shock her.

The Renaissance, or “Rebirth,” is so named because the Italians of the fifteenth and sixteenth centuries saw themselves turning away from the medieval past toward a second birth of the spiritual and intellectual goals of the ancient world. From our perspective, the culture of the Italian Renaissance owes little to the ancient world as it really was, for they knew little about it, but was a direct response to developments in medieval Europe itself. Artists rejected the earlier preference for flat, stylized religious art and grew enthusiastic about nature, naturalistic presentation, and classical myth, which they knew principally through Ovid and Vergil. But they always understood ancient myth in allegorical terms.

33. The author of this passage thinks that the Renaissance mainly originated from the influence of:
(A) The ancient Greek and Roman world (B) The medieval Europe
(C) Ovid and Vergil (D) None of the above

34. Which one of the following statements about the Renaissance artists is TRUE?
(A) They knew nothing about myths of the ancient world.
(B) There were always religious motifs in their works.
(C) They created their arts based on nature and classic myths.
(D) None of the above.

Researchers disagree on how stress and job satisfaction affect longevity. There isn’t enough data available to support a link between stress and longevity, says Edward L. Schneider, M.D., dean of the Andrus Gerontology Center at the University of Southern California. Animal research, however, provides exciting insights. In studies with laboratory rats, certain types of stress damage the immune system and destroy brain cells, especially those involved in memory. Other kinds of stress enhance immune function by 20 to 30 percent, supporting a theory first advanced by Hans Selye, M.D., Ph.D., a pioneer in stress research. He proposed that an exciting, active and meaningful life contributes to good health.

The relationship between job satisfaction and longevity also remains in question. According to some researchers, a satisfying job adds years to a man’s life, while volunteer work increases a woman’s longevity. These findings may change as more women participate in the workforce. One study found that female clerical workers suffered twice as many heart attacks as homemakers. Factors associated with the coronary problems were suppressed hostility, having a nonsupportive boss, and decreased job mobility.

35. What is the main purpose of this passage?
(A) To tell people how to live longer.
(B) To urge working women to quit their jobs.
(C) To persuade people to live an exciting, active, and meaningful life.
(D) To tell people the factors that might affect long life.

36. Which title suits best this passage?
(A) Who lives longer? (B) How to enjoy longevity
(C) The advantages and disadvantages of longevity (D) What is longevity?

This copy machine is a little bit more complicated than the ones you are used to. It has an energy-saving device that automatically turns the machine off when it’s idle for more than thirty seconds. So if you press the copy button and nothing happens, check and see if the machine is turned on. Also, when you set the copy quality, make sure it’s not on color unless that’s what you want. Your department will be charged seven NT for each color copy.

37. What is unique about the copy machine?
(A) Its output is extremely quick.
(B) It prints hi-fi color.
(C) It is more expensive than the other machines.
(D) It turns off automatically.

38. Who will be charged for color copies?
(A) The company that made the copier.
(B) The individuals that uses the copier.
(C) The department of the individual who makes the copies.
(D) Management.

The Bella Vita Center offers relaxation and stress management training for people from all walks of life, especially working professionals. Developed by psychologist and founder of the center, Dr. William Breinhelm, the health training provided here is for the mind as well as the body. Our stress management courses include free use of our world-class sauna and health spa facilities. And most importantly, we are located right in the middle of the city.

39. What type of announcement is this?
(A) A commercial (B) A business report (C) An evaluation (D) A health report

40. Who is Dr. Breinhelm?
(A) The person making the announcement.
(B) Founder of the center.
(C) He wrote an important book on psychology.
(D) A physician in the city.

In many countries today, laws protect wildlife. In India, the need for such protection was realized centuries ago.

About 300 B.C. an Indian writer described forces that were somewhat like national parks today. The killing of game beasts was carefully controlled. Some animals were fully protected. Within the forest, nobody was allowed to cut timber, burn wood for charcoal, or trap animals for their furs. Animals that became dangerous to human visitors were trapped or killed outside the park, so that other animals would not become uneasy.

The need for wildlife protection is greater now than ever before. About a thousand species of animals are in danger of disappearing, and the rate at which they are being destroyed had increased. With mammals, for instance, the rate of disappearance is now about one species every year; from A.D. 1 to 1800, the rate was about one species every fifty years. Everywhere, men are trying to solve the problem of preserving wildlife while caring for the world's growing population.

41. This account states that the need for protecting wildlife _____.
(A) was known in the distant past
(B) is greater now than ever before
(C) Both A and B
(D) Neither A nor B

42. It is said that in the forest of long ago _____.
(A) people were given permits to burn wood for charcoal
(B) animals were allowed to be trapped for their furs
(C) certain kinds of animals were caught to be killed
(D) people could kill any animals at random

43. Cutting timber in these forests was _____
(A) carefully controlled.
(B) prohibited.
(C) allowed to Indians only.
(D) limited to smaller trees.

44. Caring for animals in these forests included_____.
(A) taking dangerous animals out of the park before killing them
(B) employing men to look after trapped animals
(C) Both A and B
(D) Neither A nor B

45. What is implied but not stated in this essay?
(A) Hunters who kill dangerous species are severely punished by law.
(B) About a thousand species of animals are in danger of disappearance.
(C) The rate of disappearance of mammals is lower now than it was from A.D. 1 to 1800.
(D) The growth of the world's population has meant greater danger to wildlife.

It is a curious fact about the intellectual history of the past few centuries that physical and mental development have been approached in quite different ways. No one would take seriously the proposal that the human organism learns through experience to have arms rather than wings, or that the basic structure of particular organs results from accidental experience. Rather, it is taken for granted that the physical structure of the organism is genetically determined, though of course variation along such dimensions as size, rate of development, and so forth will depend in part on external factors…

The development of personality, behavior patterns, and cognitive structures in higher organisms has often been approached in a very different way. It is generally assumed that in these domains, social environment is the dominant factor. The structures of mind that develop over time are taken to be arbitrary and accidental; there is no "human nature" apart from what develops as a specific historical product…

But human cognitive systems, when seriously investigated, prove to be no less marvelous and intricate than the physical structures that develop in the life of the organism. Why, then, should we not study the acquisition of a cognitive structure such as language more or less as we study some complex bodily organ?

At first glance, the proposal may seem absurd, if only because of the great variety of human languages. But a closer consideration dispels these doubts. Even knowing very little of substance about linguistic universals, we can be quite sure that the possible variety of language is sharply limited…. The language each person acquires is a rich and complex construction hopelessly underdetermined by the fragmentary evidence available [to the child]. Nevertheless, individuals in a speech community have developed essentially the same language. This fact can be explained only on the assumption that these individuals employ highly restrictive principles that guide the construction of grammar.

46. What is the main idea of the passage?
(A) The processes of physical and mental development are totally different and must not be investigated in the same way.
(B) The development of cognitive structures such as language may be influenced by predetermined genetic controls similar to the genetic controls of physical development.
(C) For the most part, the structures of language are arbitrary and accidental.
(D) The uniformity of speech among individuals in one community supports the social origin of language.

47. According to the passage, what has been true about research into mental processes such as speech development?
(A) It has lagged behind research into the development of physical structures.
(B) It has benefited from research into the development of physical structures.
(C) It has focused on genetic mechanisms.
(D) It has assumed strong environmental influence.

48 Which of the following statements is **TRUE**?
(A) Approaches to the inquiry of physical and mental development of human beings have been much the same.
(B) It is commonly accepted that the physical structure of the organism is environmentally determined.
(C) Human organisms have arms rather than wings because of their learning experience.
(D) The physical structure of human organisms is subject to genetic control, although external factors in part influence certain aspects of development.

49. The word "arbitrary" in Paragraph 2 is closest in meaning to _____.
(A) based on individual judgment or preference (B) determined by the rule of the nature
(C) based on common agreement (D) free from any dogmatic interpretation

50. The author says in Paragraph 3 that _____
(A) human cognitive systems have been thoroughly investigated but have proven to be accidental and simple.
(B) language is one part of human cognitive structure which is not worth scientific study.
(C) the acquisition of human cognitive structure is as miraculous and complicated as the development of physical structure.
(D) the study of human cognitive systems is difficult because no scientific evidence is available.

51. Which of the following is **UNTRUE** about language in the passage?
(A) Language is part of the human cognitive structure.
(B) Each person acquires a rich and complex language in the process of cognitive development.
(C) Individuals in the same speech community need to develop the same language for the sake of communication.
(D) The evidence available to the child is fragmentary, so the rich, complex variations of language can make him feel hopeless.

It is important to understand that stupid people are like all other humans, physically. They just think differently. The ideas stupid people create tend to be original. When was the last time you spent time pondering, or even grieving, over someone's "stupid" idea? It seems that people are always talking about someone else's dumb idea. This would suggest that stupid people might have the upper hand when it comes to thinking up original ideas. In fact, the next time someone wants an original idea for something, he should try talking to someone considered to be a bit "foolish". A "stupid" person thinks with his head as a smart one does, but not in the same organized manner. By thinking in their fashion, "stupid" people form ideas more naturally, without the interruptions from the logical editing of thoughts typical of "logical" people. From this seemingly irrational thinking process of "stupid" people often springs forth creativity.

Furthermore, "stupid" people are always remembered. The quiet and smart person is always hard to detect, and often remains anonymous. There is a very good reason for this. The mind has a hard time keeping quiet people in its memory track. But it is much easier and pleasing for the mind to remember someone really stupid. Thus, one can exploit a "stupid" person's notoriety to quickly disseminate an important message when the need arises. Stupidity clearly has many advantages, as long as one is smart enough to use them!

52. How are stupid people similar to smart people?
(A) They think alike. (B) Both are very rational.
(C) They are physically similar. (D) They are very quiet.

53. According to the author, which characteristic is typical of the ideas of stupid people?
(A) Creative (B) Rational (C) Unmemorable (D) Pleasing

54. Why are smart and quiet people not as easy to remember as stupid people?
(A) Smart people prefer to remain anonymous.
(B) Smart people enjoy being forgotten.
(C) The human brain has difficulty in remembering quiet people.
(D) Stupid people outnumber smart people.

55. What is the conclusion of this article?
(A) Stupid people are always more creative than smart people.
(B) Stupidity can be advantageous if it is used smartly.
(C) Stupid people do not think.
(D) Smart people are worthless.

IV: Composition: Please write a 200-word essay on the following topic. Your essay should have a good organization, with a beginning thesis paragraph, a body, and a conclusion. 20 points.

Topic: Therapeutic Cloning: Humane or Immoral?

高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:微積分　　考試時間: 80 分鐘　　共 3 頁

說明:一、請用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液（帶），未遵照正確作答方法而致無法判讀者，考生自行負責。
二、試題及答案卡必須繳回，不得攜出試場。

（一）是非題：20 %。（是，請在答案卡（A）欄劃記；非，請在答案卡（B）欄劃記。在其他欄位劃記者，不予計分。每題 2 分，答錯不倒扣。）

1. Let f be a continuous function such that $\lim_{x\to\infty}\frac{f(x)}{x}=2$, then the infinite series $\sum_{n=1}^{\infty}\frac{f(n)}{n^3}$ converges.

2. Let f be a continuous function defined on interval $[a,b]$. If $f(a)f(b)-f(a)-f(b)+1<0$, then there exists a number c between a and b such that $f(c)=1$.

3. If f is integrable on $[a,b]$, then there exists a number $c\in[a,b]$ such that $\int_a^b f(x)dx=f(c)(b-a)$.

4. If $|f|$ is a Riemann integrable function on the interval [0, 1], then f is integrable on [0, 1].

5. Let f be a function defined as follows:
$$f(x)=\begin{cases}\sin x, x\in Q,\\ x, x\in \Re\setminus Q.\end{cases}$$
Then $f(x)$ is differentiable at $x=0$.

6. We already know that the series $\sum_{k=1}^{\infty}\frac{(-1)^{k+1}}{k}$ is convergent. Now, rewrite the series by combining 2^n consecutively positive terms in the series, then followed by 2^n consecutively negative terms, where n = 1, 2, 3, …, to get a new series as follows:
$(1+\frac{1}{3})-(\frac{1}{2}+\frac{1}{4})+(\frac{1}{5}+\frac{1}{7}+\frac{1}{9}+\frac{1}{11})-(\frac{1}{6}+\frac{1}{8}+\frac{1}{10}+\frac{1}{12})+\ldots$, then the new series is still convergent.

7. If $\lim_{x\to\infty} f'(x)=1$, then $\lim_{x\to\infty}\frac{f(x)}{x}=1$.

8. If $\sum a_n$ is a converging series with a_n for any $n\in N$, then $\lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right|<1$.

9. If $f:(a,b)\to R$ has a relative extremum at $c\in(a,b)$, then either $f'(c)=0$ or $f'(c)$ does not exist.

10. If f is continuously differentiable and $z=f(x-y)$, then $z_x+z_y=0$.

（二）選擇題：80 %（單選題，每題 5 分，答錯一題倒扣 1.25 分，倒扣至本大題零分為止，未做答不給分亦不扣分。）

11. Let $f(x)=x\sin x$, then $\lim_{n\to\infty}\frac{1}{n}\sum_{k=1}^{n} f(\frac{\pi}{4}+\frac{k\pi}{2n})$ = ?

(A) 1　(B) $\frac{\pi}{2}$　(C) $\sqrt{2}$　(D) 2　(E) $\frac{\pi}{\sqrt{2}}$

12. $\int_1^e (x\ln x)^2 dx=?$

(A) $\frac{e^3}{3}-\frac{e^2}{2}+\frac{1}{6}$　(B) $\frac{e^3}{3}$　(C) $\frac{1}{3}$　(D) $\frac{5e^3}{27}-\frac{2}{27}$　(E) $\frac{e^3}{3}-\frac{1}{3}$

背面有試題

13. Find the tangent of the curve $x^3 - x^2y^2 + y^3 = 5$ at point $(1, 2)$.

(A) $5x + 24y - 53 = 0$ (B) $5x - 24y + 43 = 0$ (C) $5x - 8y + 11 = 0$ (D) $5x + 8y - 21 = 0$ (E) $5x - 12y + 19 = 0$

14. Consider the function $f(x) = \begin{cases} -x^2 - x & \text{if } x < 0 \\ 4x^3 - 15x^2 + 12x & \text{if } x \geq 0 \end{cases}$. The absolute minimum value of the function f on the interval $[-\frac{1}{2}, 1]$ is:

(A) -4 (B) 0 (C) $\frac{1}{4}$ (D) 1 (E) $\frac{11}{4}$

15. Find a and b so that function $f(x) = ax^3 + bx^2 + 1$ will have a relative minimum value at a point inside the open interval (1, 3).

(A) $a = 1, b = 1$ (B) $a = 1, b = -1$ (C) $a = -1, b = 2$ (D) $a = 2, b = -4$ (E) $a = -1, b = 3$

16. Consider the sphere $x^2 + y^2 + z^2 - 2x = 0$ and plane $\sqrt{6}\,x + y + z = 0$. Find the angle between normal lines of these two surfaces at point (0, 0, 0).

(A) $\frac{\pi}{6}$ (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$ (E) $\frac{\pi}{2}$

17. Let $f(x)$ be a function defined by $f(x) = k + 1, \frac{1}{2^{k+1}} < x \leq \frac{1}{2^k}, k = 0, 1, 2, \Lambda$

Which of the following items is the value of the integral $\int_0^1 f(x)\,dx$?

(A) 1 (B) 2 (C) 3 (D) 4 (E) ∞

18. Let $g(x)$ be the inverse function of the function $f(x) = xe^x$, where $x \geq 0$, i.e., $g(f(x)) = x$, and $f(g(x)) = x$ for $x \geq 0$. Which of the following items is the value of the integral $\int_0^e g(x)\,dx$?

(A) e – 1 (B) 1 (C) e (D) 1 + ln 2 (E) $e^2 - 1$

19. Let $f(x)$ be a function defined by $f(x) = \frac{1}{1 - \sin x}, |x| < \frac{\pi}{2}$.

Let $p(x) = a_0 + a_1 x + a_2 x^2 + \ldots + a_n x^n + \ldots$ be the Maclaurin series of $f(x)$.
Which of the following items is the value of a_3 ?

(A) –1 (B) 0 (C) $\frac{1}{6}$ (D) $\frac{5}{6}$ (E) 1

20. Which of the following items is the value of the integral $\int_e^{e^2} \frac{1 + 2\ln x}{x \ln x}\,dx$?

(A) ln2 (B) 2 (C) ln 2*e* (D) 2 + ln2 (E) $2e^2$

21. Let $f(x) = [x]$ be the greatest integer function, where $[x]$ is the greatest integer less than or equal to x. Which of the following items is the value of the integral $\int_{-1}^{2} f(x^2 + 1)\,dx$?

(A) 3 (B) 6 (C) $8 - \sqrt{2} - \sqrt{3}$ (D) 8 (E) $8 + \sqrt{2} + \sqrt{3}$

22. Let $a_1 = 1$ and $a_{n+1} = \sqrt{2a_n}$ for $n \in N$. Which of the following items is the value of the limit $\lim_{n\to\infty} a_n$?

(A) 2 (B) 1 (C) $\frac{1}{2}$ (D) e (E) ln 2

23. Find the volume of the region E bounded by $z = x^2 + y^2$, $x^2 + y^2 = 4$ and $z = 0$.

(A) $\frac{4\pi}{3}$ (B) 2π (C) $\frac{8\pi}{3}$ (D) 4π (E) 8π

24. Find $\int_0^1 \int_0^1 y^3 e^{xy^2}\, dy\ dx$.

(A) $e-2$ (B) $e-1$ (C) $\frac{e}{2}$ (D) $\frac{e-1}{2}$ (E) $\frac{e-2}{2}$

25. Determine whether the series converges.

(A) $\sum \frac{1}{1+\ln n}$ (B) $\sum n\sin(\frac{1}{n})$ (C) $\sum \frac{\ln n}{\sqrt{n}}$ (D) $\sum \frac{n}{e^n}$ (E) $\sum \frac{1}{n}$

26. Find the directional derivative of $F(x,y,z) = xy + 2xz - y^2 + z^2$ at the point (1, −2, 1) along the curve

$x = t$, $y = t - 3$, $z = t^2$ in the direction of increasing z.

(A) $\frac{13}{\sqrt{6}}$ (B) $\frac{13}{6}$ (C) 11 (D) 13 (E) $\frac{11}{\sqrt{6}}$

高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:普通生物學　　考試時間:80 分鐘　　共 7 頁

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液（帶），未遵照正確作答方法而致無法判讀者，考生自行負責。
二、試題及答案卡必須繳回，不得攜出試場。

I. 單選題：1-30 題，每題 1 分。30%。答錯一題倒扣 0.25 分，倒扣至本大題零分為止，未作答者，不給分亦不扣分。

1. What are the two classifications of prokaryotes?
(A) Domain Bacteria and Domain Archaea.
(B) Domain Eukarya and Domain Archaea.
(C) Domain Archaea and Kingdom Monera.
(D) Domain Bacteria and Kingdom Monera.
(E) Domain Bacteria and Domain Eukarya.

2. A linkage map
(A) reflects the frequency of crossing over between X and Y sex chromosomes.
(B) can pinpoint actual loci of genes.
(C) is a genetic map based on recombination frequencies.
(D) requires preparation of karyotypes.
(E) always has a total of 100 map units.

3. The snowball Earth hypothesis provides a possible explanation for the
(A) oxygenation of Earth's seas and atmosphere.
(B) existence of hydrothermal vents on the ocean floor.
(C) diversification of animals start at the Precambrian era.
(D) colonization of land by plants and fungi.
(E) origin of O_2-releasing photosynthesis.

4. As a group, acoelomates are characterized by
(A) deuterostome development.
(B) the absence of a brain.
(C) a coelom that is not completely lined with mesoderm.
(D) a solid body without a cavity surrounding internal organs.
(E) the absence of mesoderm.

5. Diets rich in fat release enterogastrones that inhibit
(A) gastric secretion.
(B) stomach peristalsis.
(C) esophageal peristalsis.
(D) intestinal secretion.
(E) pancreatic secretion.

6. If mammalian cells receive a go-ahead signal at the G1 checkpoint, they will
(A) move directly into telophase.
(B) exit the cycle and switch to a nondividing state.
(C) complete the cycle and divide.
(D) complete cytokinesis and form new cell walls.
(E) show a drop in maturation-promoting factor (MPF) concentration.

7. Catastrophism was Cuvier's attempt to explain
(A) natural selection.
(B) uniformitarianism.
(C) evolution.
(D) the fossil record.
(E) the origin of new species.

8. The shaping of an animal and its individual parts into a body form with specialized organs and tissues is called
(A) induction.
(B) pattern formation.
(C) organogenesis.
(D) determination.
(E) differentiation.

9. The first group with flowers was the
(A) angiosperms.
(B) algae.
(C) fern allies.
(D) ferns.
(E) gymnosperms.

10. Which of the following is descriptive of protosomes?
    (A) spiral and indeterminate cleavage, schizocoelous development.
    (B) radial cleavage and determinate cleavage, schizocoelous development.
    (C) spiral and determinate cleavage, schizocoelous development.
    (D) radial and indeterminate cleavage, enterocoelous development.
    (E) radial cleavage and determinate cleavage, enterocoelous development.

11. Which of the following statements is **correct**?
    (A) Speciation occurs when mutations generate observable differences.
    (B) A species is composed of organisms located in the same habitat.
    (C) Speciation occurs when natural selection pressures reach their maximum.
    (D) A species is composed of a group of reproductive females.
    (E) Speciation occurs after populations become reproductively isolated and diverge.

12. Which of the following is **not true** about micronutrients in plants?
    (A) They generally help in catalytic functions.
    (B) They are elements required in relatively small amounts.
    (C) Overdoses of them can be toxic.
    (D) They are essential elements of plants' small size and molecular weight.
    (E) They are required for a plant to grow from a seed and complete its life cycle.

13. Which of the following statements about primary productivity is **correct**?
    (A) The highest primary productivity occurs in the open ocean.
    (B) The highest primary productivity per square meter occurs in the open ocean.
    (C) The highest primary productivity per square meter occurs in the savannah.
    (D) The highest primary productivity occurs in the tropical rain forest.
    (E) The highest primary productivity occurs in the temperate forest.

14. Which of the following statements is **true**?
    (A) The Hardy-Weinberg law applies to small, unstable populations.
    (B) Crossing over decreases variation.
    (C) Migration leads to genetic variation.
    (D) Dominant genes always occur more frequently in a population than recessive genes.
    (E) Nonrandom mating always affects no changes in gene frequency.

15. Which of the following terms did E. O. Wilson use to describe our innate appreciation of wild environments and living organisms?
    (A) biophobia. (B) bioethics. (C) biophilia.
    (D) biodiversity. (E) restoration ecology.

16. Almost all of the major animal phyla we see today appeared in the fossil record at the beginning of the
    (A) Cretaceous period. (B) Mesozoic period.
    (C) Carboniferous period. (D) Jurassic period.
    (E) Cambrian period.

17. Aphids reproduce asexually or sexually. They are likely to rely on asexual reproduction when
    (A) environmental conditions are good and unchanging.
    (B) environmental conditions are bad and changeable.
    (C) they are threatened by predators.
    (D) there is a shortage of females.
    (E) there are too many aphids for the host plant to support.

18. Membranes from cells grown in media enriched with stearate are less fluid than normal membranes. This is because
    (A) there are more transmembrane proteins.
    (B) the membranes probably have less sterols.
    (C) the membranes have a lower transition temperature.
    (D) the membranes have more saturated fatty acids.
    (E) the membranes have more unsaturated fatty acids.

19. MPF (maturation-promoting factor) turns itself off by
(A) activating an enzyme that dissociates cyclin from cyclin-dependent kinase (Cdk).
(B) activating an enzyme that phosphorylates cyclin.
(C) activating an enzyme that phosphorylates Cdk.
(D) activating an enzyme that destroys cyclin.
(E) activating an enzyme that destroys Cdk.

20. The plasma cell is specialized for the production and secretion of antibodies, and thus contains more
(A) DNA. (B) nuclear pore complexes. (C) mitochondria.
(D) endoplasmic reticulum. (E) lysosomes.

21. A harmless fly has yellow and black stripes on its abdomen like a wasp's. This is an example of
(A) coevolution. (B) mimicry.
(C) divergent evolution. (D) disruptive selection.
(E) camouflage.

22. Living in a group confers what advantage on an animal?
(A) access to mate (B) increased ability to forage
(C) protection from diseases (D) A and B
(E) B and C

23. How are the action potentials of pacemaker cells spread to other cardiac cells?
(A) via cardiac innervation
(B) via neuromuscular junctions
(C) by the sudden and instantaneous depolarization of all cardiac cells
(D) via gap junctions
(E) A and B

24. The percentage of the human genome that encodes proteins is approximately
(A) 90 %. (B) 70 %. (C) 35 %. (D) 20 %. (E) 3 %.

25. The nuclear envelope breaks down at the end of
(A) S phase. (B) G2 phase. (C) prophase. (D) metaphase. (E) anaphase.

26. Which of the following domains combines dimerization and DNA-binding surfaces in a long helix?
(A) homeodomain (B) zinc finger (C) leucine zipper (D) helix-turn-helix (E) acidic domain

27. Why do the kidney's activities require large amounts of energy?
(A) Filtration requires high blood pressure.
(B) Tubular reabsorption involves active transport.
(C) Water is removed from the urine by active transport.
(D) Osmosis occurs in energized proteins in the walls of capillaries.
(E) All of the above.

28. Hypophosphatemia is inherited as an X-linked dominant. A woman without hypophosphatemia and a man with hypophosphatemia have a daughter. The daughter mates with a male without hypophosphatemia. What is the expected phenotypic ratio of their offspring?
(A) 3 unaffected females : 1 male with hypophosphatemia
(B) 2 unaffected females : 1 unaffected male : 1 male with hypophosphatemia
(C) 1 unaffected female : 1 female with hypophosphatemia : 1 unaffected male : 1 male with hypophosphatemia
(D) 1 unaffected female : 1 male with hypophosphatemia
(E) 1 female with hypophosphatemia : 1 unaffected male

29. Birds are like their reptile ancestors, but their bodies are highly modified for flight. Which of the following characteristics is **not** an adaptation for flight?
(A) feathers (B) amniotic eggs (C) a short tail
(D) bones with air sacs (E) endothermic metabolism

30. All of the following are reasons why gas exchange is more difficult for aquatic animals than it is for terrestrial animals **except**
(A) water is harder to pump than air.
(B) water is denser than air.
(C) water contains much less O_2 than air per unit volume.
(D) gills have less surface area than lungs.
(E) exchanging gases with water causes substantial heat loss.

II. 單選題：31-65 題，每題 2 分。70%。答錯一題倒扣 0.5 分，倒扣至本大題零分為止，未作答者，不給分亦不扣分。

31. Which of the following is an example of polygenic inheritance?
(A) skin pigmentation in humans
(B) pink flowers in snapdragons
(C) sex linkage in humans
(D) white and purple color in sweet peas
(E) the ABO blood groups in humans

32. Where is the attachment site for RNA polymerase?
(A) operator region
(B) initiation region
(C) structural gene region
(D) promoter region
(E) regulator region

33. Gene flow is a concept best used to describe an exchange between
(A) individuals.
(B) chromosomes.
(C) species.
(D) males and females.
(E) populations.

34. Differentiation of teeth is greatest in
(A) reptiles. (B) mammals. (C) bony fishes. (D) sharks. (E) amphibians.

35. The primary role of oxygen in respiration is to
(A) combine with carbon, forming CO_2.
(B) catalyze the glycolysis reaction.
(C) act as an acceptor for electrons and hydrogen, forming water.
(D) yield energy in the form of ATP as it is passed down the respiratory chain.
(E) combine with lactic acid to form pyruvic acid.

36. A long-day plant will flower if
(A) it is kept in continuous far-red light.
(B) the duration of continuous darkness exceeds a critical length.
(C) the duration of continuous light is less than a critical length.
(D) the duration of continuous darkness is less than a critical length.
(E) the duration of continuous light exceeds a critical length.

37. The first plants arose during the _____ era.
(A) Cenozoic (B) Mesozoic (C) Paleozoic (D) Precambrian (E) Tertiary

38. Which of the following substances is **incorrectly** matched with its producer?
(A) aldosterone--kidney
(B) ADH--hypothalamus
(C) atrial natriuretic factor-- heart
(D) angiotensinogen--liver
(E) renin--juxtaglomerular apparatus

39. Which of the following may explain genomic imprinting?
(A) post-translational modification of proteins
(B) oncogenes
(C) DNA methylation
(D) microsatellite DNA
(E) retrotransposons

40. The repeated use of insecticides may lead to the evolution of insecticide resistance in insects. What mechanism is involved?
(A) directional selection (B) disruptive selection (C) stabilizing selection
(D) genetic drift (E) population bottleneck

41. Biomes are
(A) recognized on the basis of the dominant animal life.
(B) all of the populations of a particular species.
(C) a major type of ecosystem.
(D) unaffected by climatic factors.
(E) limited to aquatic regions.

42. *Archaeopteryx*
(A) was a transitional form between birds and mammals.
(B) had feathers and had no teeth.
(C) was a transitional form between fish and amphibians.
(D) had feathers and had a long bony tail.
(E) was a transitional from between reptiles and mammals.

43. Genetic variation is the result of all **but**
(A) the role of environment in controlling genetic expression.
(B) alteration in chromosome structure of number.
(C) gene mutation.
(D) independent assortment.
(E) genetic recombination.

44. Consider a field plot containing 200 kg of plant material. How many kg of carnivore production can be supported?
(A) 200 (B) 100 (C) 50 (D) 20 (E) 2

45. The most common pattern of dispersion in nature is
(A) random. (B) uniform. (C) indeterminate. (D) dispersive. (E) clumped.

46. Which of the following statements about movement corridors is **true**?
(A) A movement corridor connects otherwise isolated patches of quality habitat for a species.
(B) Corridors can be constructed only by humans.
(C) Riparian habitats frequently serve as effective corridors.
(D) A and C are true.
(E) A, B, and C are true.

47. Which of the following combination is **correct**?
(A) Porifera – coelomate, branch radial.
(B) Nematoda – earthworm, pseudocoelomate.
(C) Platyhelminthes – flatworms, pesudocoelomate.
(D) Echinodermata – branch bilateria, diploblastic.
(E) Cnidaria – radial symmetry, diploblastic.

48. A person suffering from AIDS would be unlikely to suffer from which of the following diseases?
(A) Rheumatoid arthritis (B) Hepatitis (C) Tuberculosis
(D) Influenza (E) Cancer

49. The vascular system of a three-year-old dicot stem consists of
(A) 3 rings of xylem and 3 of phloem. (B) 2 rings of xylem and 2 of phloem.
(C) 3 rings of xylem and 1 of phloem. (D) 1 rings of xylem and 3 of phloem.
(E) 2 rings of xylem and 3 of phloem.

50. Within the female gametophyte, three mitotic divisions of the megaspore produce
(A) the triple fushion nucleus and two synergids.
(B) three pollen grains and three antipodal cells.
(C) two antipodals and two eggs.
(D) three antipodal cells,two polar nuclei, one egg, and two synergids.
(E) a tube nucleus, a generative cell, an egg, and a sperm.

51. A pathogenic fungus invades a plant. Which of the following does the plant produce in response to the attack?
(A) antibiotics (B) antisense RNA (C) phytochrome (D) phytoalexins (E) statoliths

52. Which of the following is **correctly** paired?
(A) forebrain – diencephalons (B) midbrain – cerebellum
(C) spinal cord – brainstem (D) both A and B are correct
(E) both B and C are correct

53. Which of the following statements is **false**?
(A) Estuaries support many semiaquatic species.
(B) Many lakes in temperate regions are characterized by seasonal thermal stratification.
(C) The distribution of photosynthetic organisms is limited by the quality and intensity of light in marine ecosystems.
(D) Estuaries usually contain no or few producers.
(E) Many aquatic biomes exhibit pronounced vertical stratification of chemical variables.

54. The following organism with the greatest number of *Hox* genes should be a(n)
(A) fish. (B) fly. (C) flatworm. (D) fluke. (E) fruit fly.

55. Which of the following does **not** have a coefficient of relatedness of 0.5 in humans?
(A) a brother to his brother (B) a mother to her son
(C) an uncle to his nephew (D) a father to his daughter
(E) a sister to her brother

56. Which of the following is **true** in the logistic model of population growth?
(A) as N approaches K, the growth rate will approach zero
(B) as N approaches K, the death rate decreases
(C) as N approaches K, the carrying capacity of the environment will increase
(D) as N approaches K, the growth rate increases
(E) both C and D are correct

57. The population cycle of the snowshoe hare and its predator indicates that
(A) predators are not the only factor controlling the size of prey populations.
(B) the two species must have evolved in close contact because one cannot live without the other.
(C) both populations are controlled mainly by abiotic factors.
(D) the hare populations is r-selected, whereas the lynx population is K-selected.
(E) both C and D are correct.

58. A gastrovascular cavity, with a single opening, is the characteristic digestive system of animals in which phylum?
(A) Nematoda (B) Platyhelminthes (C) Arthropoda (D) Mollusca (E) Porifera

59. Which of the following statements about endocrine system is **false**?
(A) Hormones from the adrenal cortex control salt and water balance.
(B) An increase in endorphins blocks pain.
(C) An iodine deficiency might interfere with the production of thyroxine.
(D) Some cells can conduct nerve signals and secrete hormones.
(E) Most endocrine glands produce steroid hormones.

60. If two modern organisms are distantly related in an evolutionary sense, then one should **expect** that
(A) they should live in very different habitats.
(B) their chromosomes should be very similar.
(C) they shares a common ancestor relatively recently.
(D) they should share fewer homologous organs than two closely related organisms.
(E) they should be members of the same genus.

61. How do cleavage divisions differ from normal mitotic cell divisions?
(A) Cleavage divisions occur by meiosis, not mitosis.
(B) Cleavage divisions are slower than normal cell divisions.
(C) Cleavage divisions occur without much mRNA synthesis.
(D) Cleavage divisions divide cells into daughters with different gene sets.
(E) Both C and D are correct.

62. The endoplasmic reticulum and Golgi apparatus are very similar among the groups of alga-like protists, but chloroplasts differ significantly and appear to be related to different prokaryotes. These facts imply that
(A) The Golgi apparatus evolved before the endomembrane system.
(B) Chloroplasts evolved before the endoplasmic reticulum.
(C) Endomembrane systems evolved before chloroplasts.
(D) Endomembrane systems evolved from symbiotic prokaryotes.
(E) Both C and D are correct.

63. In the presence of an antibiotic prokaryotic translation can initiate, but only dipeptides that remain bound to the ribosome are formed. This antibiotic appears to block
(A) binding of fMet-tRNA$_i$ to P site.
(B) binding of aminoacyl-tRNA to A site.
(C) peptide bond formation.
(D) translocation.
(E) termination.

64. According to the **wobble rules**, a tRNA with the anticodon 5'-GAU-3' can recognize the codons
(A) 5'-CUA-3' and 5'-UUA-3'.
(B) 5'-CUA-3' and 5'-CUG-3'.
(C) 5'-AUC-3' and 5'-GUC-3'.
(D) 5'-AUC-3' and 5'-AUU-3'.
(E) 5'-IUC-3'.

65. Cephalization is generally associated with all of the following **except**
(A) bilateral symmetry.
(B) a brain.
(C) a longitudinal nerve cord.
(D) a sessile existence.
(E) concentration of sensory structures at the anterior end.

高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:化學　　考試時間: 80 分鐘　　共 9 頁

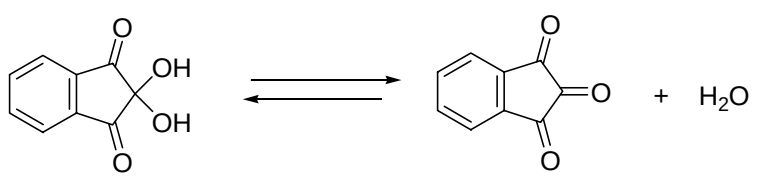
說明:一、選擇題用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液（帶），未遵照正確作答方法而致無法判讀者，考生自行負責。
二、試題及答案卡必須繳回，不得攜出試場。

I. Choose one correct answer for the following questions

每題 1 分，答錯一題倒扣 0.25 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

1. Coco-Cola® is carbonated by injecting the liquid with carbon dioxide gas. Under what conditions is the solubility of carbon dioxide gas the greatest?
   (A) low temperature, low pressure　(B) low temperature, high pressure
   (C) low temperature, pressure is not a factor　(D) high pressure, temperature is not a factor
   (E) high temperature, high pressure

2. Ninhydrin is the hydrate of a triketone and is in equilibrium with it.



   In the following statements which one is TRUE?
   (A) Ninhydrin is a good reagent for testing α-amino acids, usually carried out at acidic condition.
   (B) The positive ninhydrin test usually exhibits an intense purple color.
   (C) Ninhydrin is a good reagent for testing nucleosides, usually carried out at basic condition.
   (D) The positive ninhydrin test usually exhibits a red color.
   (E) The positive ninhydrin test usually exhibits a green color.

3. Which one is WRONG for gas chromatography?
   (A) The mobile phase does not interact with molecules of the sample.
   (B) Capillary columns provide higher resolution than packed columns.
   (C) Reproducible retention times require control of the column temperature.
   (D) Immobilized liquid phase should be chemical inert and low volatile.
   (E) This method is applicable to species that are appreciably non-volatile.

4. Which of the following contains the metal with the lowest oxidation number?
   (A) $CaCl_2$　(B) $FeSO_4$　(C) MnO_2　(D) CrO_3　(E) NaBr

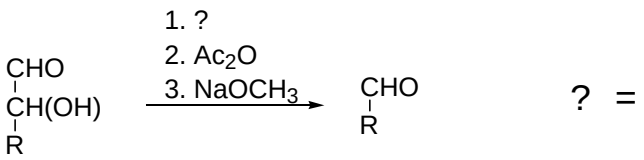
5. Which detector is used in the infrared spectrum?
   (A) phototube　(B) photomultiplier tube
   (C) photodiode arrays　(D) silicon photodiodes
   (E) thermal detector

6. A fatty acid gives nonanal and 9-oxononanoic acid on ozonolysis followed by zinc treatment. This fatty acid gives stearic acid on hydrogenation by H_2/Pd. What is this fatty acid?
   (A) Lauric acid　(B) Palmitic acid　(C) Arachidic acid　(D) Oleic acid　(E) Arachidonic acid

7. Cell membranes are composed mostly of _____ organized into a lipid bilayer which serves as an effective barrier to the passage of water, ions, and other components into and out of cells.
   (A) glycerophospholipids　(B) sphingomyelins　(C) prostaglandins
   (D) lipids　(E) fatty acid

背面有試題

8. Wohl degradation: a multi-step reaction sequence for degrading an aldose into the next lower homolog. What is the missing reagent in the following Wohl degradation?



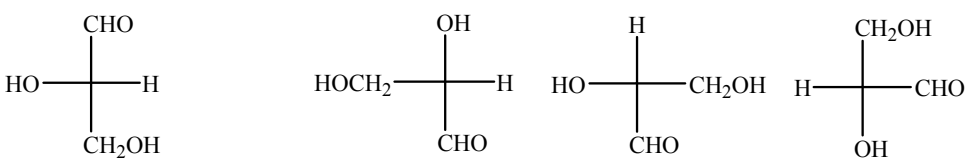
(A) $KMnO_4$ (B) AgO (C) NH_3 (D) NH_2NH_2 (E) NH_2OH

9. Lactose yields 1 equivalent D-glucose and 1 equivalent _____ on hydrolysis.
(A) D-fructose (B) D-galactose (C) D-mannose (D) D-ribose (E) D-deoxyribose

10. Sucrose is an example of_____.
(A) a reducing sugar (B) a ketohexose (C) an anomer of ribose (D) an aldohexose (E) a disaccharide

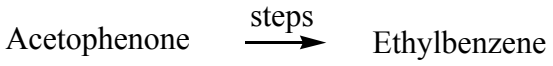
11. Glucosamine, the monosaccharide unit from chitin has an amino group at what position?
(A) C1 (B) C2 (C) C3 (D) C4 (E) C5

12. Which of the following Fischer projections of glyceraldehydes represent the same configuration with **A**?



(A) ①, ③ (B) ①, ② (C) ②, ③ (D) ①, ②, ③ (E) none of these

13. Choose the set of reagents which best accomplishes the desired conversion.



(A) sulfuric acid, H_2O (B) 1. hydrogen peroxide, H_2O; 2. KOH
(C) 1. sodium borohydride; 2. KOH (D) 1. hydroxylamine; 2. H_2O
(E) 1. hydrazine; 2. KOH, H_2O

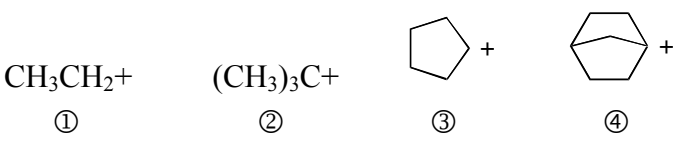
14. The mass spectrum of 5-methyl-2-hexanone shows two typical fragments. One is m/z = 43 due to α-cleavage at the more highly substituted side of the carbonyl group, the other one is m/z = ? due to McLafferty rearrangement.
(A) 51 (B) 54 (C) 56 (D) 58 (E) 60

15. A nitro group is _____ electrophilic aromatic substitution.
(A) displaced in (B) reduced in (C) activating for (D) para directing for (E) deactivating for

16. How many different alkenes have the molecular formula C_5H_{10}, including *E, Z* isomers?
(A) 4 (B) 5 (C) 6 (D) 8 (E) none of the above

17. From each pair pick the compound with the higher boiling point.
(i) ① acetic acid or ② propanoic acid
(ii) ③ n-pentane or ④ neopentane
(iii) ⑤ methane or ⑥methyl chloride
(A) ①, ③, ⑤ (B) ①, ④, ⑤ (C) ②, ④, ⑥ (D) ②, ③, ⑥ (E) ①, ④, ⑥

18. Place in order of stability (most stable FIRST):

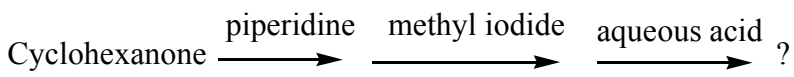


(A) ④, ②, ③, ① (B) ②, ③, ①, ④
(C) ②, ①, ③, ④ (D) ④, ②, ①, ③
(E) none of the above is correct

19. Pentane can be distinguished from ethyl ether by the following test:
(A) Only ether liberates hydrogen when sodium is added.
(B) Only ether dissolves in concentrated sulfuric acid.
(C) Only ether gives a positive iodoform test.
(D) Only ether is reduced by sodium borohydride.
(E) Only ether is oxidized by aqueous dichromate.

20. If 1-hexyne is added to a solution of sodium amide, a gas is evolved. What is it?
(A) C_6H_{14} (B) NH_3 (C) C_6H_{12} (D) C_6H_{10} (E) C_2H_2

21. In the following reaction, choose the MAJOR organic product.



(A) N-methylpiperidine
(B) methylcyclohexane
(C) 2-methylcyclohexanone
(D) 1-methylcyclohexanol
(E) 1-methylcyclohexene

22. The pinacol rearrangement proceeds via _____ route.
(A) an electrophilic substitution
(B) a free radical
(C) a cycloaddition
(D) a carbocation
(E) a carbanion

23. If the nitrogen of pyrrole is protonated, the ring is _____.
(A) cleaved
(B) no longer aromatic
(C) susceptible to electrophilic substitution
(D) expanded
(E) unaffected

24. The anilinium ion exhibits _____.
(A) no characteristic IR bands
(B) increased solubility in hexane compared to aniline
(C) a purple color due to charge delocalization
(D) decreased reactivity for electrophilic substitution compared to aniline
(E) a facile decomposition to ammonia

25. How many hydrogen atoms are present in each molecule of 1,3-dimethylbicyclo[1.1.0]butane?
(A) 10 (B) 12 (C) 13 (D) 14 (E) 15

26. Consider ① Cl^-, ② OH^-, ③ SH^-, and ④ CH_3^-. The CORRECT order of nucleophile reactivity is (strongest nucleophile LAST):
(A) ④, ③, ②, ① (B) ④, ②, ①, ③ (C) ②, ①, ③, ④ (D) ①, ②, ③, ④ (E) ①, ③, ④, ②

27. How many grams of $Ca(NO_3)_2$ can be produced by reacting excess HNO_3 with 7.40 g of $Ca(OH)_2$? [Ca = 40]
(A) 10.2 g (B) 16.4 g (C) 32.8 g (D) 8.22 g (E) 7.40 g

28. For the redox reaction $2\ Fe^{2+} + Cl_2 \longrightarrow 2\ Fe^{3+} + 6\ Cl^-$, which of the following are the correct half-reaction?

① $Cl_2 + 2e^- \longrightarrow 2\ Cl^-$ ② $Cl \longrightarrow Cl^- + e^-$ ③ $Cl_2 \longrightarrow 2\ Cl^- + 2e^-$
④ $Fe^{2+} \longrightarrow Fe^{3+} + e^-$ ⑤ $Fe^{2+} + e^- \longrightarrow Fe^{3+}$

(A) ① and ④ (B) ① and ⑤ (C) ② and ④ (D) ② and ⑤ (E) ③ and ④

29. Samples of the gases $H_2(g)$ and $SO_2(g)$ have equal masses and are at the same temperature and pressure. Calculate the ratio of volumes $\frac{V_{H_2}}{V_{SO_2}}$.
(A) 1.0 (B) 0.18 (C) 32 (D) 5.6 (E) 180

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30. For the following reaction

$$PCl_5\,(g) \rightleftharpoons PCl_3\,(g) + Cl_2\,(g) \qquad \triangle H = -89\ KJ$$

How can the equilibrium be shifted to the right?

(A) add more PCl_5 (B) decrease the pressure by changing the volume
(C) remove Cl_2 (D) remove PCl_3
(E) all of the above are correct

31. Given the following data

	$\triangle H^o_f$ (KJ/mol)
$H_2O(l)$	-286
$H_2O(g)$	-242

Calculate $\triangle S$ for the process $H_2O(l) \longrightarrow H_2O(g)$ at 100°C

(A) 1.18 J / K mole (B) 11.8 J / K mole (C) 118 J / K mole (D) 1180 J / K mole (E) none of the above

32. Calculate the pH of 0.10 M NH_4CN. (K_b for $NH_3 = 1.8 \times 10^{-5}$; K_a for HCN = 6.2×10^{-10})
(A) 9.23 (B) 8.87 (C) 8.21 (D) 5.79 (E) 5.13

33. Calculate the work for the expansion of CO_2 from 1.0 to 2.5 liters against a pressure of 1.0 atm at constant temperature.

(A) 1.5 liter · atm (B) 2.5 liter · atm (C) 0 (D) -1.5 liter · atm (E) -2.5 liter · atm

34. Green light has a wavelength of 5.50×10^2 nm. The energy of a photon of green light is:
(A) 3.64×10^{-38} J (B) 2.17×10^5 J (C) 3.61×10^{-19} J (D) 1.09×10^{-27} J (E) 5.45×10^{12} J

35. According to the Bohr model for the atom:
(A) electrons are located in similar orbitals (B) electrons have identical energies
(C) protons spin counterclockwise (D) electrons can only occupy specific orbitals
(E) all of the above are correct

36. The maximum number of electrons that can occupy a 4d sub-shell is:
(A) 4 (B) 6 (C) 8 (D) 10 (E) varies

37. How many electrons are in a hydride ion if it has a charge of -1?
(A) 0 (B) 1 (C) 2 (D) 3 (E) 1.5

38. A polar covalent bond results from two atoms:
(A) unequally sharing a pair of electrons (B) equally sharing a pair of electrons
(C) one atom giving up an electron (D) two atoms sharing a single electron
(E) hydrogen atom overlap

39. Which of the following molecules would you expect to be polar?
(A) CO_2 (B) CH_4 (C) CH_2Cl_2 (D) H_2 (E) F_2

40. The entropy of the universe is always increasing. This is a statement of _____.
(A) 1st law of thermodynamic (B) 2nd law of thermodynamics
(C) 3rd law of thermodynamics (D) Hess' law
(E) Gibbs' law

41. The reaction of NaOH with a fat is referred to as:
(A) esterification (B) dissociation (C) hydrolysis (D) saponification (E) condensation

42. For a reaction to be spontaneous, which of the following must be TRUE?
(A) delta H must be negative (B) delta H must be positive
(C) delta S must be negative (D) delta S must be positive
(E) delta G must be negative

43. How many mL of 15 M HNO_3 are needed to make 500 mL of a 2 M solution?
(A) 0.015 (B) 0.03 (C) 33.3 (D) 66.7 (E) 15

44. Which of the following is NOT a property of alcohols compared to alkenes?
(A) exhibit hydrogen bonding
(B) higher solubility in water
(C) can be oxidized to form aldehydes or ketones
(D) undergo dehydration in acid
(E) undergo addition reaction with bromine

45. Which of the following process is used by nuclear power plant?
(A) Fission (B) Fusion (C) Gamma emission (D) Isotope dilution (E) Radiation

46. What is the complementary sequence (3' → 5') to the DNA segment CAT ?
(A) ATG (B) TAA (C) AGG (D) CAT (E) GTA

47. An atom becomes an ion by:
(A) gaining or losing protons
(B) gaining or losing electrons
(C) gaining or losing neutrons
(D) gaining or losing mass
(E) gaining or losing isotope

48. In order for the electron to return to the ground state, what must happen?
(A) energy is absorbed (B) energy is released (C) no energy change (D) electron is lost (E) electron is gained

49. Which bond is the least polar? (Electronegativities: H = 2.2; N = 3.0; O = 3.5; P = 2.1; S = 2. 5)
(A) N-H (B) P-H (C) O-H (D) S-H (E) P-S

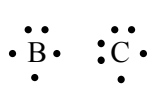
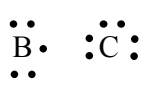
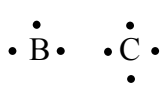
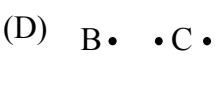
50. For a double displacement reaction demonstration in class, a solution of potassium iodide and a solution of lead (II) nitrate were combined. A precipitate was formed as a product. What color was the precipitate?
(A) white (B) green (C) yellow (D) black (E) red

51. Which one is WRONG for the safety in the laboratory?
(A) Wear eye protection at all times.
(B) In the event of contact with acids, immediately flood the affected area with copious quantities of water.
(C) Never work alone in the laboratory.
(D) Never use your mouth to provide suction.
(E) It is legal to flush solutions containing heavy metal ions or organic liquids down the drain.

52. Which working electrode is used for pH measurement?
(A) Ag/AgCl electrode (B) Calomel electrode (C) Hg electrode (D) Glass electrode (E) Pt electrode

53. Salt A and salt B were dissolved separately in 100 mL beakers of water. The water temperatures were measured and recorded as shown in the table below:
Salt A: initial water temp. 25.1°C final water temp. 30.2°C
Salt B: initial water temp. 25.1°C final water temp. 20.0°C
Which statement is a CORRECT interpretation of these data?
(A) The dissolving of only salt A was endothermic.
(B) The dissolving of only salt B was exothermic.
(C) The dissolving of both salt A and salt B was endothermic.
(D) The dissolving of salt A was exothermic and the dissolving of salt B was endothermic.
(E) The dissolving of both salt A and salt B was endothermic.

54. How many moles of oxygen gas, O_2, will react with 2 moles of nitrogen monoxide gas, NO, according to the following equation? ___ NO (g) + ___ O_2 (g) ⟶ ____ NO_2 (g) [O_2 = 32.00 g/mol; NO = 30.01; NO_2 = 46.01]
(A) 1 mol (B) 2 mol (C) 3 mol (D) 4 mol (E) none of the above

55. Which pair of Lewis electron-dot symbols correctly depicts the elements: boron and carbon?
(A)  (B)  (C)  (D)  (E) B C

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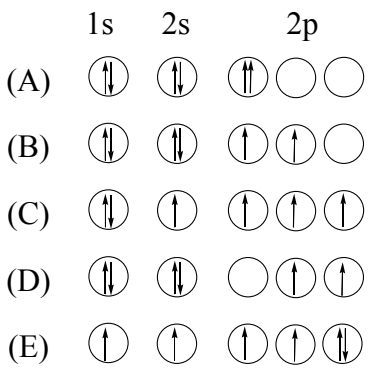
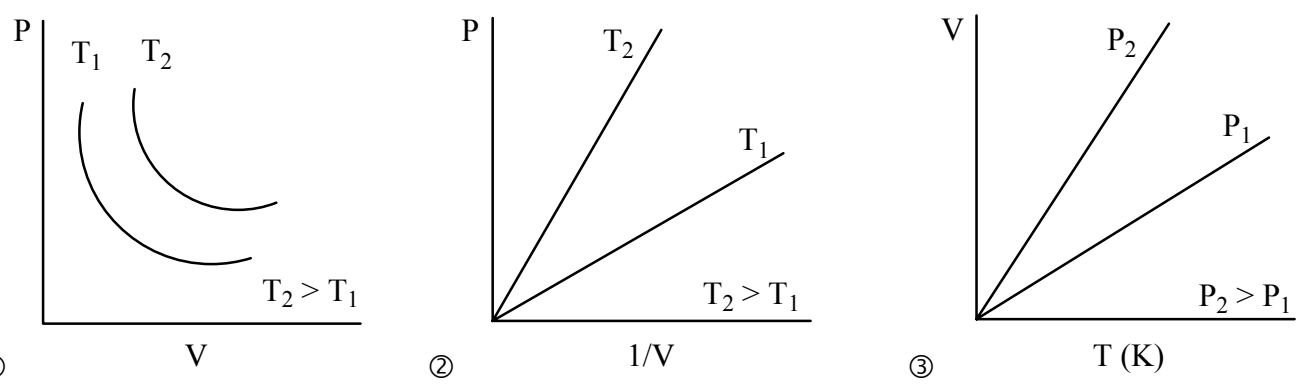
56. Which pair of words correctly completes this statement: Ultraviolet light is more dangerous than infrared light because it has more energy. The _____ of ultraviolet light is _____ than infrared light.

(A) wavelength – longer (B) frequency – higher
(C) speed – greater (D) speed – less
(E) frequency – lower

57. Which orbital diagram violates the rule "no two electrons can have the same set of four identical quantum numbers"?

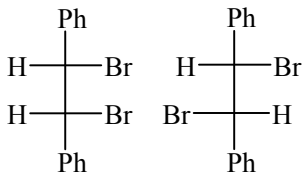


58. Which of the following plots correctly describe ideal gas behavior?



(A) ①, ②, ③ (B) only ① and ② (C) only ① and ③ (D) only ② and ③ (E) only ①

59. These compounds are:



(A) enantiomers (B) diasteroisomers (C) conformers (D) geometrical isomers (E) identical

60. Rank the following molecules in order of **decreasing** C-C bond length of their **shortest** C-C bonds.

①: benzene ②: 1,3-butadiene ($CH_2CHCHCH_2$) ③: 1,2-propadiene (CH_2CCH_2) ④: ethyne (HCCH)
(A) ① > ②> ③ > ④ (B) ④> ③> ②> ① (C) ③> ②> ④ > ① (D) ①> ③> ② > ④ (E) ④> ② > ③> ①

II. Choose one correct answer for the following questions

每題 2 分，答錯一題倒扣 0.5 分，倒扣至本大題零分為止，未作答，不給分亦不扣分。

61. Which one is CORRECT for buffer capacity of a solution?

(A) It is defined as the number of moles of a strong acid or a strong base that cause 1 mL of the buffer to undergo a 1.00-unit change in pH.
(B) It depends only on the total concentration of buffers, not on their concentration ratio.
(C) The pKa of the acid chosen for a given application should lie within ± 1 unit of the desired pH for the buffer.
(D) A buffer solution of any desired pH can be prepared by combining calculated quantities of buffer pair, no need any adjustment.
(E) Dissociation constants would not interfere with the predicted pH values.

62. There is a titration of 50.00 mL of 0.0500 M Fe^{2+} with 0.1000 M Ce^{4+} in a medium (1.0 M H_2SO_4). Calculate the potential after the addition of 25.00 mL of Ce^{4+}.

$Ce^{4+} + e^- \rightarrow Ce^{3+}$ $\quad E^o = 1.44$ V (1 M H_2SO_4)

$Fe^{3+} + e^- \rightarrow Fe^{2+}$ $\quad E^o = 0.68$ V (1 M H_2SO_4)

(A) 0.64 V (B) 1.06 V (C) 1.56 V (D) 2.01 V (E) 2.21 V

63. What mass of $Ba(IO_3)_2$ (487 g/mol) ($Ksp = 1.57 \times 10^{-9}$) can be dissolved in 400.0 mL of water at 25℃?

(A) 0.732 mg (B) 5.45 mg (C) 0.142 g (D) 0.178 g (E) 0.280 g

64. The iron in a 0.6656-g ore sample was reduced quantitatively to the +2 state and then titrated with 26.75 mL of the $KMnO_4$ solution (0.02966 M). Calculate the percentage of Fe_2O_3 (Fe=55.8 g/mol) in the sample.

(A) 95.12 % (B) 47.56 % (C) 43.12 % (D) 38.04 % (E) 19.02 %

65. Which of the following compounds does NOT react with acetyl chloride?

(A) C_2H_5OH (B) $C_6H_6 + AlCl_3$ (C) CH_3COONa (D) C_2H_5Cl (E) $C_2H_5NHC_2H_4OH$

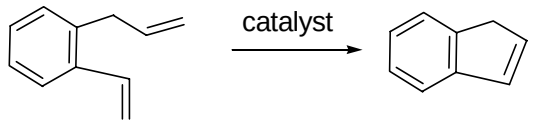
66. A compound exhibits an infrared band at 2245 cm^{-1} and is hydrolysed by mineral acid to give an organic acid. The original compound is:

(A) an ester (B) an amide (C) a nitrile (D) an acid anhydride (E) an alkyne

67. Compound **X** has an empirical formula CH_2 and a molecular weight of 84. When **X** is subjected to ozonolysis two organic products are obtained; only one of these reduces Fehling's solution and both give positive iodoform reactions. **X** is:

(A) hex-1-ene (B) hex-2-ene
(C) hexa-1,4-diene (D) 3-methylpent-2-ene
(E) 2,3-dimethylbut-2-ene

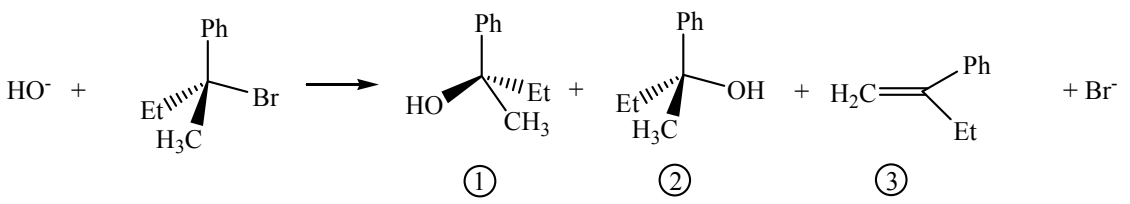
68. Metathesis reactions have been known for many years, and one of examples is given as follow.



What catalyst is commonly used in running the metathesis reactions?

(A) Lindlar catalyst (B) Raney nickel (C) Grubbs' catalyst (D) $Pd(OH)_2/C$ (E) None of above

69.



If the above reaction was strictly S_N1, the organic product(s) would be:

(A) ① only (B) ① and ② (C) ①, ② and ③ (D) ② only (E) ③ only

70. The minimum concentration of oxygen necessary to sustain fish life in an aquarium is 4 mg/L. Assuming the density of the aquarium water solution is 1.00 g/mL, what is the minimum concentration of O_2 expressed in parts per million (ppm).

(A) 2 ppm (B) 4 ppm (C) 2000 ppm (D) 250 ppm (E) 0.004 ppm

71. For the reaction 2 A + B → products, determine the rate law for the reaction given the following data:

A: Initial Concentration, M	B: Initial Concentration, M	Initial Rate, $M \cdot s^{-1}$
0.1	0.1	2.0×10^{-2}
0.2	0.1	8.0×10^{-2}
0.3	0.1	1.8×10^{-1}
0.2	0.2	8.0×10^{-2}
0.3	0.3	1.8×10^{-1}

(A) rate = $k[B]^2$ (B) rate = $k[A]$ (C) rate = $k[A][B]$ (D) rate = $k[A]^2$ (E) rate = $k[A][B]^0$

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72. A certain carbohydrate compound (containing only C, H and O) is 53.3 % C, 11.1 % H, and 35.6 % O by mass. The experimentally determined molecular mass is 90 amu. What is the empirical and chemical formula for this carbohydrate?

(A) C_2H_5O (B) C_3H_5O (C) CH_3O (D) $C_3H_5O_2$ (E) $C_4H_{10}O_2$

73. Given the standard reaction enthalpies for the following reactions:
What is $\triangle H^o$ for the reaction: $C_3H_8(g) + 5\ O_2(g) \rightarrow 3\ CO_2(g) + 4\ H_2O(g)$

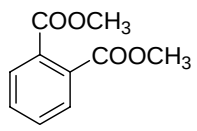
$3\ C(s) + 4\ H_2(g) \rightarrow C_3H_8(g)$ $\triangle H^o = -103.8$ kJ
$C(s) + O_2(g) \rightarrow CO_2(g)$ $\triangle H^o = -393.5$ kJ
$2\ H_2(g) + O_2(g) \rightarrow 2\ H_2O(g)$ $\triangle H^o = -483.6$ kJ

(A) 773.3 kJ (B) -773.3 kJ (C) -2043.9 kJ (D) -2251.5 kJ (E) -2527.5 kJ

74. Propose a structure for a compound $C_5H_{10}O$ that fit the following ^{1}H-NMR data: δ 0.92 (3H, t, J = 7 Hz), 1.20 (6H, s), 1.50 (2H, q, J = 7 Hz), 1.64 (1H, br s).

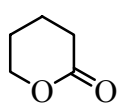
(A) isopentanol (B) 2-methyl-2-butanol (C) isopropyl methyl ketone
(D) 2-methyl-1-butanol (E) ethyl propyl ether

75. How many signals are expected in the ^{13}C NMR spectrum of the following compound?



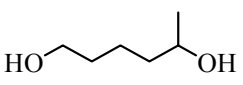
(A) 5 (B) 6 (C) 7 (D) 8 (E) 10

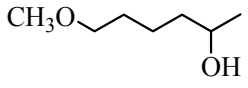
76. What is the product of the following reaction?

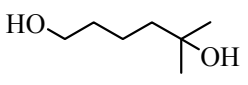


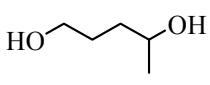
+ 2 CH_3MgBr $\xrightarrow[2.\ H_2O]{1.\ THF}$?

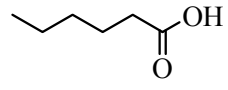
? =

(A) 

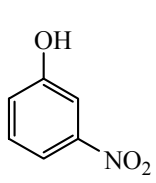
(B) 

(C) 

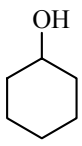
(D) 

(E) 

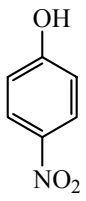
77. Rank the following in order of decreasing acid strength (most acidic FIRST).



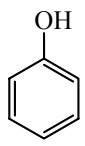
①



②



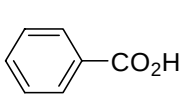
③



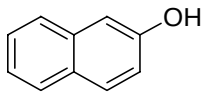
④

(A) ② > ④ > ① > ③ (B) ① > ③> ④ > ② (C) ③> ① > ② > ④ (D) ③> ①> ④ > ② (E) ①> ② > ③> ④

78. Which of the following choices correctly describe the solubility of benzoic acid (I) and 2-naphthol (II) in the aqueous solution shown?



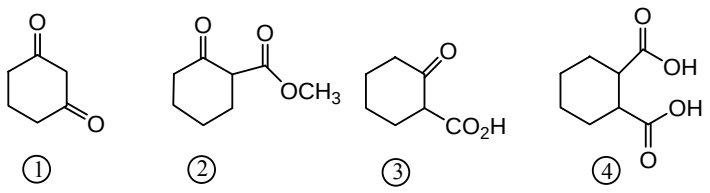
I



II

	Aq. NaOH		Aq. $NaHCO_3$
(A) I, soluble;	II, insoluble	I, insoluble;	II, soluble
(B) I, insoluble;	II, soluble	I, soluble;	II, insoluble
(C) I, soluble;	II, soluble	I, soluble;	II, insoluble
(D) I, soluble;	II, insoluble	I, soluble;	II, insoluble
(E) I, soluble;	II, soluble	I, soluble;	II, soluble

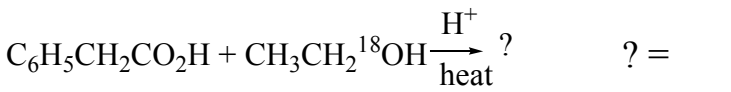
79. Which of the following compounds will undergo decarboxylation on heating?



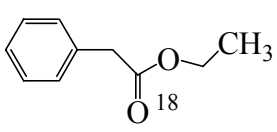
① ② ③ ④

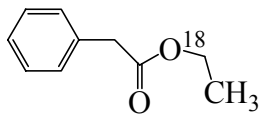
(A) ① and ②　　(B) ② and ③　　(C) ③ and ④　　(D) ③ only　　(E) ④ only

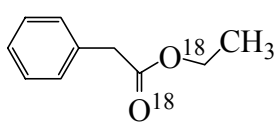
80. What is the product from the following esterification?

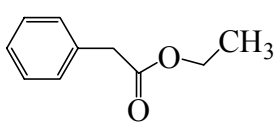


? =

(A) 

(B) 

(C) 

(D) 

(E) none of the above

高雄醫學大學九十三學年度學士後醫學系招生考試試題

科目:普通物理學　　考試時間: 80 分鐘　　共 5 頁

說明:一、選擇題用 2B 鉛筆在「答案卡」上作答，修正時應以橡皮擦拭，切勿使用修正液（帶），未遵照正確作答方法而致無法判讀者，考生自行負責。
二、試題及答案卡必須繳回，不得攜出試場。

【單選題】每題 4 分，共計 100 分。答錯一題倒扣 1 分，倒扣至零分為止，未作答，不給分亦不扣分。

1. Light of wavelength 680 nm falls on two slits and produces an interference pattern in which the fourth-order fringe is 38 mm from the central fringe on a screen 2.0 m away. What is the separation of the two slits?
(A) 1.4×10^{-4} m
(B) 2.1×10^{-4} m
(C) 2.8×10^{-4} m
(D) 4.2×10^{-4} m
(E) 5.6×10^{-4} m

2. A long solenoid of 500 turns carrying a current of 3.8 A produces within itself a uniform magnetic flux of 2.0 mWb. What is the self-inductance of the coil?
(A) 0.13 H
(B) 0.26 H
(C) 0.36 H
(D) 0.46 H
(E) 0.52 H

3. In a sinusoidal-ac circuit, the current is $I=I_0 \sin(\omega t+\theta_0)$. What is the rms (root-mean-square) current ?
(A) I_0/π
(B) $I_0/1.414$
(C) $I_0/0.707$
(D) πI_0
(E) $2\pi I_0$

4. A cylinder of mass 10.0 kg rolls without slipping on a horizontal surface. At the instant when its center of mass has a speed of 10.0 m/s, what is the cylinder's total energy?
(A) 200 J
(B) 250 J
(C) 500 J
(D) 750 J
(E) 1000 J

5. A sample of 770 mol of nitrogen gas is maintained at a constant pressure of 1.00 atm in a flexible container. The gas is heated from 40°C to 180°C. What is the change in internal energy?（ Cp=6.95 cal/mol·C°, R=8.315 J/mol·K）
(A) 3.32×10^4 J
(B) 2.24×10^6 J
(C) 6.22×10^6 J
(D) 7.12×10^7 J
(E) 8.82×10^7 J

6. A 1.00-kg mass is attached to a horizontal spring. The spring is initially stretched by 0.100 m and the mass is released from rest there. After 0.500 s, the speed of the mass is zero. What is the maximum speed of the mass?
(A) 0.326 m/s
(B) 0.438 m/s
(C) 0.510 m/s
(D) 0.593 m/s
(E) 0.628 m/s

7. What is the absolute pressure at the bottom of a lake that is 30.0 m deep, when the air pressure is 1.0 atm?
(A) 4.32×10^{3} Pa
(B) 6.65×10^{4} Pa
(C) 2.36×10^{5} Pa
(D) 3.95×10^{5} Pa
(E) 4.89×10^{5} Pa

8. A magnetic field given by B（t）=0.2t - 0.5t^{2} T is directed perpendicular to the plane of a circular coil containing 25 turns of radius 1.8 cm and whose total resistance is 1.5Ω. What is the power dissipation at 3 s ?
(A) 2.28 mW
(B) 3.38 mW
(C) 4.52 mW
(D) 5.56 mW
(E) 6.72 mW

9. Suppose that the temperature at the center of the Sun is 2.00×10^{7} K, what is the average translational kinetic energy of a proton in the Sun's center? （$k_B=1.38\times10^{-23}$ J/K）
(A) 1.38×10^{-16} J
(B) 4.14×10^{-16} J
(C) 5.52×10^{-16} J
(D) 7.64×10^{-16} J
(E) 8.96×10^{-16} J

10. A nonconducting sphere of radius 10 cm has charge uniformly distributed throughout its volume. The electric field is directed radially outward and its strength at 5 cm from the center is 2000 N/C. What is the volume charge density of the sphere? ($\in_0=8.85\times10^{-12}\,C^2/N\cdot m^2$）.
(A) 1.06 μC/m^3
(B) 2.12 μC/m^3
(C) 3.16 μC/m^3
(D) 4.06 μC/m^3
(E) 5.18 μC/m^3

11.When radiation of wavelength 350 nm is incident on a surface, the maximum kinetic energy of the photoelectrons is 1.2 eV. What is the stopping potential for a wavelength of 230 nm?（ $h=6.63\times10^{-34}$ J·s, $q_e=-1.60\times10^{-19}$ C, $c=3\times10^{8}$ m/s）
(A) 1.65 V
(B) 2.04 V
(C) 2.55 V
(D) 3.05 V
(E) 4.82 V

12. An electron in the hydrogen atom makes a transition from the n=5 level to the n=2 level. What is the wavelength of the emitted photon? （$q_e = -1.60\times10^{-19}$ C, h=6.63×10^{-34} J·s）
    (A) 326 nm
    (B) 435 nm
    (C) 578 nm
    (D) 662 nm
    (E) 769 nm

13. A proton is projected toward a fixed nucleus of charge +Ze with velocity V_0. Initially the two particles are very far apart. When the proton is at a distance R from the nucleus, its velocity has decreased to $1/2\ V_0$. How far from the nucleus will the proton be when its velocity has dropped to $1/4\ V_0$?
    (A) 1/16 R
    (B) 1/4 R
    (C) 1/2 R
    (D) 4/5 R
    (E) 6/7 R

14. An important observation that led Bohr to formulate his model of the hydrogen atom was the fact that _____.
    (A) the emission of light by an atom did not appear to conserve energy.
    (B) electrons were found to have a wave nature.
    (C) the peak of the blackbody radiation moved to shorter wavelengths as the temperature was increased.
    (D) neutrons formed a diffraction pattern when scattered from a nickel crystal.
    (E) a low density gas emitted a series of sharp spectral lines.

15. If the peak electric field in an electromagnetic wave is 1200 V/m , what is the peak magnetic field for the same wave?
    (A) 2.2×10^{-6} T
    (B) 3.4×10^{-6} T
    (C) 4.0×10^{-6} T
    (D) 8.7×10^{-6} T
    (E) 9.6×10^{-6} T

16. The square plates of a 9000 pF capacitor measure 90 mm by 90 mm and are separated by a dielectric which is 0.29 mm thick. The voltage rating of the capacitor is 300 V. The dielectric strength of the dielectric, in kV/m , is closest to _____.
    (A) 930
    (B) 1000
    (C) 1100
    (D) 1200
    (E) 1300

17. Electromagnetic standing waves are set up in a conducting cavity resonator in the form of a hollow metal box. The waves bounce back and forth between two parallel surfaces separated by 0.8 cm. What is the minimum resonant frequency for such a resonator?
    (A) 3.30 GHz
    (B) 4.42 GHz
    (C) 12.4 GHz
    (D) 15.5 GHz
    (E) 18.8 GHz

背面有試題

18. The potential energy function of a particle moving in one dimension is $U = kx^2 e^{-x^2/a^2}$ where $a = 7.50$ nm.
At what value of x is a point of stable equilibrium located?
(A) 6.81 nm
(B) 7.50 nm
(C) 7.80 nm
(D) 11.03 nm
(E) 12.62 nm

19. A proton with speed $v = 3.00 \times 10^5$ m/s orbits just outside a charged sphere. The radius of the orbit is 1.0 cm. What is the charge on the sphere? (The mass of a proton is 1.67×10^{-27} kg.)
(A) 1.04×10^{-9} C
(B) 3.47×10^{-8} C
(C) 6.23×10^{-8} C
(D) 6.50×10^{-8} C
(E) 8.28×10^{-7} C

20. A 1.0μF capacitor with an initial stored energy of 0.50 J is discharged through a 1.0 MΩ resistor. What is the current through the resistor when the discharge starts?
(A) 1.0×10^{-3} A
(B) 2.0×10^{-3} A
(C) 1.0×10^{-2} A
(D) 2.0×10^{-2} A
(E) 5.0×10^{-2} A

21. A hollow sphere of inner radius 8.0 cm and outer radius 9.0 cm floats half-submerged in a liquid of density 800 kg/m^3. What is the density of the material of which the sphere is made?
(A) 1.1×10^3 kg/m^3
(B) 1.3×10^3 kg/m^3
(C) 1.8×10^3 kg/m^3
(D) 2.4×10^3 kg/m^3
(E) 4.8×10^3 kg/m^3

22. Three sinusoidal waves of the same frequency travel along a string in positive direction of an x axis. Their amplitudes are y_1, $y_1/2$ and $y_1/3$, and their phase constants are 0, π/2, and π, respectively. What is the phase constant of resultant wave?
(A) 30°
(B) 37°
(C) 45°
(D) 53°
(E) 60°

23. A girl is sitting near the open window of a train that is moving at a velocity 10.00 m/s to the east. The girl's uncle stands near the tracks and watches the train move away. The locomotive whistle emits sound at the frequency of 500.0 Hz. The air is still. What frequency does the uncle hear? (The speed of sound is 343 m/s .)
(A) 471.7 Hz
(B) 485.8 Hz
(C) 500.0 Hz
(D) 515.0 Hz
(E) 530.0 Hz

24. Two point charges $q_1 = 2.1\times10^{-8} C$ and $q_2 = -4q_1$ are fixed in two places 50 cm apart. The point charge q_1 is at the right side of q_2. Find the point at which the electric field is zero, along the straight line passing through the two charges. The point is _____.
(A) 50 cm to the right of q_1
(B) 50 cm to the left of q_2
(C) 100 cm to the right of q_1
(D) 100 cm to the left of q_2
(E) The middle point between q_1 and q_2

25. A 5.0 g marble is fired vertically upward from a spring gun. The spring must be compressed 8.0 cm if the marble is to just reach a target 20 m above the marble's position on the compressed spring. What is the spring constant of the spring?
(A) 1.6 N/cm
(B) 1.8 N/cm
(C) 2.5 N/cm
(D) 3.1 N/cm
(E) 6.2 N/cm

微積分

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
答案	A	A	B	B	A	B	A	B	A	A	C	D	C	B	D	AB	B	A	D	D	C	A

化學

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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答案	C	D	C	D	B																	

普通生物學

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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答案	D	A	D	A	C	A	A	B	E	D	C	C	D	D	D							

普通物理學

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國文

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答案	E	E	A	B	B																	

英文

題號	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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答案	D	C	A	C	B																	

23	24	25	26
E	E	D	A

23	24	25
B	D	A
48	49	50
B	B	C
73	74	75
C	送分	A

23	24	25
D	E	C
48	49	50
A	C	D

23	24	25
B	A	D

23	24	25
C	C	A

23	24	25
A	C	A
48	49	50
D	A	C