

高醫後西醫 《生物》 試題評析

曾正老師試題評析

一、命題分佈比重：

範疇	題數	題目
基本概念	4 題	第 18、33、58、66 題
細胞學	5 題	第 5、20、34、57、72 題
生物能量學	5 題	第 21、35、36、61、70 題
遺傳學	16 題	第 6、7、8、9、16、17、19、22、23、24、37、38 題 第 39、40、55、56 題
分類學	8 題	第 15、32、42、43、44、50、60、74 題
植物生理學	2 題	第 45、68 題
動物生理學	12 題	第 12、26、31、47、51、52、54、59、62、63、67 題 第 73 題
演化學 (含行為學)	13 題	第 1、2、10、11、14、25、30、41、48、53、65、69 題 第 71 題
生態學	10 題	第 3、4、13、27、28、29、46、49、64、75 題

二、試題評析：

1. 此次後西醫考題仍與本人預測相同：分生、演化、生態佔題極高，另外動物生理亦有相當高的配分，但值得注意的是生物分類學的比重加重。
2. 今年題目平實，無太多超過命題教本—Campbell biology 以外的內容，題庫課上演練的題目大幅度的命中考題。
3. 老師說過：熟讀講義，演練題目是勝利的不二法門，但上課要注意觀念的啓發而非死背教條，如此才能高人一等。
4. 預估優等生可拿到 80 分以上的好成績，中等生亦可拿到近 70 分的成績，本人所交的學生定可笑傲考場。

三、試題詳解：

題號	試題說明
1	$(\frac{1}{2})^2 \therefore \text{carbon-14} : \text{carbon-12} = 5700 \times 2 = 11400$ 年 (命中演化學：放射性同位素訂年法)
2	天擇的能量妥協，天擇導致適應，亦即子代的存活率提升，但須親護付出損耗。(命中演化學：天擇)
3	特徵置換是減少競爭的方法，而非是抗捕食者的防禦策略。 (命中生態學：減少競爭的方式)

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4	據 WHO 估計，DDT 的使用前後約拯救了 2500 萬人的生命，但經常使用超量，更糟的是在環境中極難分解（在生物體內代謝的半衰期為 8 年），故視為環境毒物。（命中演化學：DDT 造成物種的演化）
5	合作性有“正合作性”及“負合作性”，包括活化與抑制。 （命中酵素學：異位調節）
6	異型合子的表現在孟氏遺傳中，其表現與顯性同型合子表現出的表型相同。 （命中古典遺傳學：孟氏遺傳的變異）
7	按題意，此為標準的性別決定 X - O system（命中古典遺傳學：性別決定）
8	領導股合成是透過 DNAP III 以 5' → 3' 方向連續的合成（接近複製叉）。 （命中分子生物學：DNA 複製）
9	果蠅胚胎發育，體軸決定的首個基因開啓是卵極化基因（即母性效應基因）。 （命中發生遺傳學：果蠅的胚胎發育）
10	演化來自不同祖先，但具有類似的功能，此為同功器官的代表例，為趨同演化所致。 （命中演化學：同功器官）
11	新的植物種的起源通常是源於同域物種形成，透過雜交為異源多倍性。 （命中演化學：物種的形成）
12	病毒感染體細胞，體細胞膜表面的 MHC I 分子會出現病毒的多肽片段。 （命中動物生理學：免疫系統）
13	生物所能利用的環境之無生物及生物資源稱為該生物的生態位。 （命中生態學：生態位的定義）
14	表型變異的影響因子除了基因型變異以外，還有環境的因子，中性變異並不會產生表型的變異。（命中演化學：遺傳變異的來源）
15	細菌的性菌毛是產生接合橋所需，故可轉移 Tet ^r 的基因給生境中的其它細菌。 （命中細菌遺傳學：接合生殖）
16	題目言及配子形成，故答案僅有減數分裂的後期（I） （命中細胞遺傳學：減數分裂的過程）
17	使得基因移動至不同控制區下游的移位會使得基因產物的表現發生改變而發生癌化。（命中分子生物學：癌症的起源）
18	據題意製備 less acidic 的有機分子，答案僅有胺基（pK _a ≈ 9.8）。 （命中生物有機化學：官能基的特性）
19	RFLP 是基於限制酶對對偶基因限制序列的辨識所得到的片段長度差異而來區分對偶基因間的差異。（命中遺傳工程：RFLP）
20	植物的大型胞器—液泡貯存水，可使得植物細胞的體積較動物細胞大。 （命中細胞學：植物的液泡）
21	天線色素分子的功能：吸收光子而傳遞能量給反應中心驅動光反應。 （命中光合作用：光反應的吸光色素）
22	有絲分裂末的子細胞與 G ₁ 期的親代細胞相較之下（因尚未複製），DNA 的含量及染色體數目皆相同（2C，2N）。（命中細胞遺傳學：有絲分裂）
23	核型的製備是生物體所有的染色體展示排列。（命中細胞遺傳學：核型製備）

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24	DNAP III 是細菌真正的延長酶，催化新的核苷酸至成長股中。 (命中分子生物學：DNA 複製)
25	系統發生樹僅是演化關係的假想描繪，很可能隨證據的改變而重新置放生物之間的關係。(命中演化學：系統發生樹的建構)
26	隨著卵裂持續，卵裂球大小愈小代表著其數目愈多。 (命中動物生理學：胚胎學)
27	資源分配使得享有相同生態位的生物得以共存(即使其生態位有所不同，使其利能用不同處的資源以減少競爭)。(命中生態學：減少競爭的方法)
28	生產者包括光合作用的植物、細菌及原生生物。(命中生態學：食物鏈)
29	大型物種的生殖率較低，極易因過度開發而滅絕。 (命中生態學：生物多樣性的影響因子)
30	成體較以往來的高大，肯定是因基因流使對偶基因的頻率發生改變。 (命中演化學：微演化的機制)
31	胰島素降低血糖，而胰升血糖素升高血糖，二者互為拮抗。 (命中動物生理學：內分泌系統)
32	刺胞動物特徵：有固著性的 polyp 及運動性的 medusa，其神經與肌肉為最簡單的型式，消化循環腔僅有一開口，且可作為流體靜液壓骨骼。 (命中動物分類學：刺胞動物門)
33	澱粉酶專門水解 α (1 \rightarrow 4) 鍵，故纖維素及幾丁質無法被水解(因具有 β (1 \rightarrow 4) 鍵)。(命中生物有機化學：糖類)
34	小泡是沿著微管(作為軌道)移動而非沿中型絲移動。 (命中細胞學：細胞骨架)
35	糖解時，葡萄糖轉變成丙酮酸並形成 2ATP 及 2NADH，而大部分的能量仍未釋出，是保存在丙酮酸分子中。(命中生物能量學：糖解)
36	卡文循環發生在 stroma，不包括光反應，且利用 ATP 及 NADPH 合成糖，卡文循環並非是光呼吸。(命中生物能量學：暗反應)
37	減數分裂及有絲分裂中，DNA 皆僅複製一次。 (命中細胞遺傳學：有絲分裂與減數分裂的比較)
38	花斑貓係因 X 染色體失活的方式隨機產生所致。 (命中古典遺傳學：巴氏體與 X 染色體失活)
39	領導股及延滯股合成皆需有 RNA 引子，且二者皆添加新的核苷酸至成長股的 3 端，領導股連續合成(接近複製叉)，延滯股不連續合成(遠離複製叉)。 (命中分子生物學：DNA 複製)
40	此題以刪除法,(A)(C)(D)(E)絕對正確，(B)乍看無誤，但 intron 的存在是 exon shuffling 的基礎，然而有些 intron 仍可轉譯。 (命中分子生物學：轉錄後加工)
41	最早陸棲生物應是單細胞且是原核生物，且因它進行光合作用大氣才有 O ₂ 的出現。 (命中演化學：生物的起源)
題號	試題說明
42	莖膜及纖毛的功能使菌體可相互附著，或是使菌體附著至其它物質表面。 (命中細菌學：細菌的細胞內組成)

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43	瘧原蟲 (plasmodium, 導致瘧疾) 與錐蟲 (trypanosoma, 導致昏睡症) 會改變表面蛋白而一再入侵人類的免疫系統。(命中生物分類學: 原生生物)
44	分生孢子梗著生的分生孢子涉及真菌的無性生殖。 (命中生物分類學: 真菌的特徵)
45	根瘤菌不會提供葡萄糖給植物, 反而是植物提供給根瘤菌的一種養分。 (命中植物生理學: 根瘤菌與豆科植物)
46	附生植物雖生長在其它植物上, 但是自身行光合作用而不由宿主獲得養分。 (命中植物生理學、生態學: 植物的營養及物種間交互作用)
47	Broca' s area 是語言運動區, 而 Wernicke' s area 是語言的理解區。 (命中動物生理學: 神經系統)
48	根據 Hamilton' s rule: $rB > C$ 藉由親緣係數的相關性, 蒙受利它行爲的獲益者所獲得的利益須超過給予者所蒙受的損失, 則天擇有利於此種行爲。(命中行爲學: 利它行爲)
49	生物多樣性的最大威脅是生境的改變、碎裂及破壞。 (命中生態學: 保育生物學)
50	海綿動物或有孔動物不屬於 Eumetazoa。(命中生物分類學: 動物的分類)
51	ADH 是增加集尿管對 H ₂ O 的重吸收。(命中動物生理學: 排泄系統)
52	血紅素除了可結合 O ₂ 亦可結合 CO ₂ 而形成 HbCO ₂ (carbaminohemoglobin)。 (命中動物生理學: 呼吸系統)
53	古生物學家是研究化石的生物學家, 拋棄胚胎學、發生學、分子生物學、解剖學的研究手段, 直接檢視牙齒, 爬蟲類的牙齒不如哺乳類牙齒的特化(此為最符合)。(命中演化學: 演化的証據)
54	血液是血球及細胞碎片懸浮在液體的基質(血漿), 符合結締組織的定義。 (命中動物生理學: 動物的組織)
55	貓哭症是 5 號染色體短臂缺失所致, 而非重複。 (命中古典遺傳學: 染色體異常)
56	共顯性是異型合子的二個基因皆有表現, 而非介於同型合子顯性及同型合子隱性表現型之間(不完全顯性才是)。(命中古典遺傳學: 孟氏遺傳的變異)
57	具飽和脂肪酸的磷脂數目多, 會使膜的流動性下降但黏滯度增加。 (命中細胞學: 生物膜的結構)
58	磷酸雙酯鍵是核苷酸與核苷酸之間糖—磷酸—糖的鍵結, 而非嘌呤與磷酸之間的鍵結。(命中生物有機化學: DNA 的結構組成)
59	此題答案有誤, glucocorticoids (ex: cortisol) 不涉及血壓與血量的調節, 而 mineralocorticoids 的 aldosterone 才涉及, 並非是二者。 (命中動物生理學: 內分泌系統)
60	HIV 不是蚊子攜帶的逆轉錄病毒, 登革熱是蚊子直接感染人類, H ₁ N ₁ 是種 A 型流感病毒, B 型肝炎盛行率為 15~20%。(命中生物分類學: 病毒學)
61	ATP 合成酶是催化 ADP 及 Pi 合成 ATP。(命中生物能量學: 合成 ATP 的機器)
62	鳥的通氣優於人類是因鳥肺的 P _{O₂} 極大(因鳥類具單一方向氣流, 故在每次的呼吸中, 肺可將空氣完全更新)。(命中動物生理學: 呼吸系統)

題號	試題說明
63	耳蝸可區分音調 (pitch) 而非音量 (volume)，主要是因基底膜在長度上並非是均質的結構。(命中動物生理學：神經系統)
64	(B) 屬於湖泊性的季節性翻轉範圍，不屬於全球氣候模式討論的要點。 (命中生態學：氣候的組成)
65	貢獻生物多樣性的原因之一是需要生境的地理歷史久遠，而 (D) 顯然是與條件相違背。(命中生態學：物種多樣性的探討)
66	系統生物學是種基於研究系統各部份的交互作用而用來研究生物學的手段，而著重於建構整個生物系統的動態行為。 (命中生物學概念：系統生物學的定義)
67	化學突觸的生化事件為： AP 到達軸突末梢→Ca ²⁺ 流入→突觸小泡釋放神經傳遞物質→神經傳遞物質與突觸後細胞膜結合→配基門控離子通道開啓。 (命中動物生理學：神經系統)
68	植物的乾重是吸收空氣中的 CO ₂ 進行光合作用所致 (透過葉的氣孔吸收)。 (命中植物生理學：植物的營養)
69	因 collagen 是動物含量最多的蛋白質 (因題目言及沒有一個基因是絕對保守的前提)。(命中動物生理學：動物的組織)
70	糖解不產生 CO ₂ ，氧化磷酸化的產物是 ATP 及 H ₂ O。 (命中生物能量學：糖解)
71	此屬於合子形成後隔離，此稱為 hybrid inviability，題目未打字完成，應該送分。 (命中演化學：隔離的機制)
72	Starch 在室溫之下要分解成單糖係因活化能屏障尚未克服。 (命中酵素學：酵素的性質)
73	食物短缺，胰升血糖素 (glucagon) 分泌提升血糖量—平時，而處於壓力下，腎上腺素也能分泌，促進血糖上升以應付壓力情況。 (命中動物生理學：內分泌系統)
74	原口變成口部，即為原口類，且幼蟲為担輪幼蟲，且具真體腔，那麼必定是軟體動物或環節動物。(命中生物分類學：動物的演化樹)
75	在小的生境之族群較大的生境之族群更易遭受滅絕的危機。 (命中生態學：物種多樣性的探討)

楊老師試題評析

- 一、今年題目難易與去年相比大致相似，題目算偏易。許多是抄自題庫。
 二、幾乎沒有超出範圍的題目，大都是純生物的題目。
 三、歷年考試所佔分數比例及試題難易分析如下：

	100 年	101 年	102 年	說明
簡介	0%	1%	2%	考 systems biology (中) → 上課有特別強調
生化	1%	0%	6%	考 acidic、inked、amylase break down、hydrolysis of starch 基本概念 (易)
細胞學	9%	4%	4%	考①plant vacuole、motor proteins 基本概念(易); ②membrane fluidity (中)
能量學	5%	1%	8%	考 thylakoid、enzyme、glycolysis、Calvin cycle、ATP synthesis、cellular respiration 基本概念 (易)
遺傳	5%	13%	12%	考 cell cycle、karyotype、Mendelian genetics、X-0 system、malignant tumors、mitosis and meiosis、calico、chromosomal alterations、Codominance 基本概念 (易)
分生	17%	17%	6%	考①lagging strand、DNA polymerase III、bacterial DNA replication、conjugation、RFLP 基本概念 (易); ②split gene and RNA splicing (細)
胚胎	4%	2%	2%	考 Segmentation gene、blastomeres 基本概念 (易)
生理	13%	33%	21%	1.組織：考疏鬆結締組織 (中) 2.免疫：考 MHC、日本腦炎、H7N9 基本概念 (易) 3.呼吸：考 respiratory pigment、Birds and mammals、基本概念 (易) 4.排泄：考 ADH、RAAS 基本概念 (易) 5.神經概論：考 neural transmission 基本概念 (易) 6.特殊感覺：考 Wernicke's and Broca's、hearing system 基本概念 (易) 7.內分泌：考 adrenal hormones、飢餓、antagonistic effects、sympatric speciation、variation 基本概念 (易)
演化學	17%	7%	9%	考①half life、energetic trade-offs、Convergent evolution 基本概念 (易) ② Phylogenetic trees、diversity of organisms (中) ③ postzygotic barrier (推理)
分類學	9%	3%	14%	考①producers、刺胞動物、bacteria to adhere、fungi 無性生殖、Eumetazoa、reptile or mammal Examine the teeth 基本概念 (易) ② burrowers(掘穴動物(細)) ③逃避 immune system、marine plankton、(中) ④構建系統發育→collagen genes (難)
植物學	3%	8%	2%	考 dry weigh、rhizobacteria、附生植物基本概念 (易)
行爲	3%	3%	3%	考 Antipredator Behavior、immigration、Hamilton's rule、resource partitioning 基本概念 (易)
生態學	12%	9%	9%	考全球氣候模型、Ecological niche、過度開發、多樣性威脅、habitat fragmentation、toxin in the environment 基本概念 (易)

- 四、很少有難的題目，幾乎題庫裏全部都命中，只要英文程度不錯 (看題目夠快)，有做題目的應該可以考很高分。

五、總整理命中或提到相關概念事實如下，歡迎參閱：

題號		頁數	題號		頁數
1	總整理	P50	39	總整理	P11
2	總整理	P48	40	總整理	P12
3	總整理	P35	41	總整理	P53
4	總整理	P39	42	總整理	P52
5	總整理	P4	43	總整理	P53
6	總整理	P9	44	總整理	P54
7	總整理	P9	45	總整理	P44
8	總整理	P11	46	總整理	P41
9	總整理	P16	47	總整理	P30
10	總整理	P47	48	總整理	P35
11	總整理	P48	49	總整理	P39
12	總整理	P22	50	總整理	P56
13	總整理	P38	51	總整理	P24
14	總整理	P48	52	總整理	P23
15	總整理	P13	53	總整理	P58
16	總整理	P9	54	總整理	P18
17	總整理	P9	55	總整理	P10
18	總整理	P2	56	總整理	P9
19	總整理	P15	57	總整理	P3
20	總整理	P3	58	總整理	P2
21	總整理	P4	59	總整理	P33
22	總整理	P7	60	總整理	P22
23	總整理	P10	61	總整理	P5
24	總整理	P11	62	總整理	P23
25	總整理	P50	63	總整理	P30
26	總整理	P17	64	總整理	P39
27	總整理	P38	65	總整理	P48
28	總整理	P52	66	總整理	P1
29	總整理	P39	67	總整理	P27
30	總整理	P35	68	總整理	P43
31	總整理	P33	69	總整理	P58
32	總整理	P56	70	總整理	P6
33	總整理	P2	71	總整理	P48
34	總整理	P3	72	總整理	P2
35	總整理	P5	73	總整理	P33
36	總整理	P16	74	總整理	P56
37	總整理	P8	75	總整理	P39
38	總整理	P10			

《生物》

I. 【單選題】1-50 題，每題 1 分，共計 50 分。答錯 1 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。

- (C) 1. A fossil that has one fourth the normal proportion of carbon-14 to carbon-12 is approximately _____ years? (Carbon-14 half life is about 5,700 years)
 (A) 1,350 (B) 2,750 (C) 11,400 (D) 16,800 (E) 22,400
- (C) 2. Natural selection involves energetic trade-offs between _____
 (A) the reproductive strategy of semelparity and iteroparity.
 (B) the population increasing and decreasing.
 (C) high survival rates of offspring and the cost of parental care.
 (D) number of reproductive females and reproductive ability.
 (E) the number of offspring and how long they live.
- (E) 3. Which option listed in below is **NOT** an antipredator defensive behavior?
 (A) Camouflage (B) Aposematic coloration (C) Batesian mimicry
 (D) Mullerian mimicry (E) Character displacement
- (E) 4. Which of the following descriptions about “toxin in the environment” is **INCORRECT**?
 (A) The biological magnification is the toxin become more concentrated in trophic level of food web.
 (B) Chlorinated hydrocarbons has demonstrated biological magnification.
 (C) Some low toxic chemicals transform high toxic by exploring sunlight or microbial metabolism.
 (D) Chemicals released into the environment may be relatively harmless but converted to more toxic product by reaction with other substances, by exposure to light, or by the metabolism of microorganism.
 (E) WHO allows that DDT strictly reuse in disease vector control in 2007, so DDT is not environmental toxin anymore.
- (D) 5. Which of the following descriptions about “regulating of enzyme activity in metabolism” is **INCORRECT**?
 (A) Allosteric regulation is the term used to describe any case in which a protein’s function at one site is affected by the binding of a regulatory molecule to a separate site.
 (B) An activating or inhibiting regulatory molecule binds to a regulatory site that is the simplest kind of allosteric regulation.
 (C) Feedback inhibition is a common mode of metabolic control.
 (D) Cooperativity is a type of enzyme activation, not including inhibition.
 (E) Cooperativity is the binding of one substrate molecule that can stimulate binding or activity at other active sites.
- (B,E) 6. Mendel used the scientific approach to indentify two laws of inheritance, which comment about “Mendelian genetics” is **NOT** correct?
 (A) Mendelian genetics includes two laws as law of segregation and law of independent assortment.
 (B) The law of segregation states that genes have alternative forms, or alleles.
 (C) The law of independnet assortment states the pair of alleles for a given gene segregates into gametes independently of the pair of alleles for any other gene.
 (D) Traits are inherited in discrete units, and are not the results of blending.
 (E) In heterozygotes, the two alleles are different, and the expression of two different alleles makes phenotypic effects of the other.
說明：(B)選項 the law of segregation 的定義在 CAMPBELL Biology 9th P.311 : states that the two...in different gametes.故本題答案(B)敘述不正確。
- (B) 7. Which sex determination system is suitable for the following descriptions?
 There is only one type of sex chromosome, the females have two sex chromosomes, males have only one sex chromosome. Sex of the offsprings is determined by whether the sperm cell contains

- an X chromosome or no sex chromosome.
 (A) The X-Y system (B) The X-0 system (C) The Z-W system
 (D) The haplo-diploid system (E) None
- (C) 8. Bacteria is one of major group of prokaryotes, which of the following description about “bacterial DNA replication” is **NOT** correct?
 (A) Helicase unwinds the parental double helix DNA.
 (B) Primase begins synthesis of the RNA primer for the Okazaki fragment in lagging strand.
 (C) The leading strand is synthesized continuously in the 5' to 3' direction by DNA polymerase II.
 (D) DNA polymerase I removes the primer from the 5' end of the second fragment, replacing it with DNA.
 (E) DNA ligase joins the 3' end of the second fragment to the 5' end of the first fragment.
- (D) 9. Which genes should be turned on first to determinate the body axis during embryogenesis of *Drosophila*?
 (A) Pair rule genes (B) Segmentation genes (C) Segmentation polarity genes
 (D) Maternal effect genes (E) Homeotic genes
- (B) 10. The eyes of mammalian and octopus are similar in structure and function. Which of following hypothesis accounts for most of this similarity?
 (A) Balanced polymorphism (B) Convergent evolution (C) Parallel evolution
 (D) Cladogenesis (E) Macroevolution
- (A,D) 11. A new species of plant could be originated by hybridization coupled with _____
 (A) autopolyploidy. (B) polymorphic speciation. (C) a super species.
 (D) sympatric speciation. (E) allopatric speciation.
- 說明：本題(A)選項 autopolyploidy 是屬於(D)選項 sympatric speciation 其中一個機制，故本題(A)與(D)選項皆正確。**
- (D) 12. The dengue virus fragments will be presented by virus-infected cells along with which of the following?
 (A) Toll receptor (B) Complement (C) Antibodies (D) Class I MHC molecules
 (E) Class II MHC molecules
- (B) 13. The sum of a species' use of the biotic and abiotic resources in its environment is called the species' _____?
 (A) niche (B) ecological niche (C) resource niche (D) environment niche
 (E) ecological statement
- (A) 14. Which statement about variation is true?
 (A) All new alleles are the result of nucleotide variability.
 (B) All phenotypic variation is the result of genotypic variation.
 (C) All genetic variation produces phenotypic variation.
 (D) All nucleotide variability results in neutral variation.
 (E) All geographic variation results from the existence of clines.
- (A) 15. In a hypothetical situation, the genes for sex pilus construction and for tetracycline resistance are located together on the same plasmid within a particular bacterium. If this bacterium readily performs conjugation involving a copy of this plasmid, then the result should be _____.
 (A) the rapid spread of tetracycline resistance to other bacteria in that habitat.
 (B) the subsequent loss of tetracycline resistance from this bacterium.
 (C) the production of endospores among the bacterium's progeny.
 (D) the temporary possession by this bacterium of a completely diploid genome.
 (E) a transformed bacterium.
- (E) 16. Mendel's observation of the segregation of alleles in gamete formation has its basis in which of the following phases of cell division?
 (A) Anaphase of mitosis (B) Prophase I of meiosis (C) Prophase II of meiosis
 (D) Metaphase I of meiosis (E) Anaphase I of meiosis
- (C) 17. Abnormal chromosomes are frequent in malignant tumors. Errors such as translocations may place a gene in close proximity to different control regions. Which of the following might then occur to make the cancer worse?

- (A) Sensitivity of the immune system (B) An increase in non-disjunction
 (C) Expression of inappropriate gene products (D) A decrease in mitotic frequency
 (E) Death of the cancer cells in the tumor
- (B) 18. A chemist wishes to make an organic molecule less acidic. Which of the following functional groups should be added to the molecule in order to do so?
 (A) phosphate (B) amino (C) sulfonyl (D) sulfhydryl (E) carboxyl
- (E) 19. RFLP analysis can be used to distinguish between alleles based on differences in which of the following?
 (A) the ability of nucleic acid probes to hybridize to the alleles
 (B) the proteins expressed from the alleles
 (C) the ability of the alleles to be replicated in bacterial cells
 (D) the amount of DNA amplified from the alleles during PCR
 (E) restriction enzyme recognition sites between the alleles
- (A) 20. The volume enclosed by the plasma membrane of plant cells is often much larger than the corresponding volume in animal cells. The most reasonable explanation for this observation is that _____.
 (A) plant cells contain a large vacuole that increases the volume of the cell.
 (B) plant cells are capable of having a much higher surface-to-volume ratio than animal cells.
 (C) plant cells have a much more highly convoluted (folded) plasma membrane than animal cells.
 (D) animal cells are more spherical, while plant cells are elongated.
 (E) the basic functions of plant cells are very different from those of animal cells.
- 說明：本題題目只針對為何植物細胞的體積常大於動物細胞的體積，最合理的解釋即是選項 (A) 植物細胞具有較多或較大的液泡造成細胞的體積較大。**
- (C) 21. In the thylakoid membranes, what is the main role of the antenna pigment molecules?
 (A) concentrate photons within the stroma
 (B) split water and release oxygen to the reaction-center chlorophyll
 (C) harvest photons and transfer light energy to the reaction-center chlorophyll
 (D) synthesize ATP from ADP and Pi
 (E) transfer electrons to ferredoxin and then NADPH
- (B) 22. How do the daughter cells at the end of mitosis and cytokinesis compare with their parent cells when it was in G₁ of the cell cycle?
 (A) The daughter cells have the same number of chromosomes and half the amount of DNA.
 (B) The daughter cells have the same number of chromosomes and the same amount of DNA.
 (C) The daughter cells have the same number of chromosomes and twice the amount of DNA.
 (D) The daughter cells have half the amount of cytoplasm and half the amount of DNA.
 (E) The daughter cells have half the number of chromosomes and half the amount of DNA.
- (C) 23. What is a karyotype?
 (A) The combination of chromosomes found in a gamete.
 (B) A system of classifying cell nuclei.
 (C) A display of every pair of homologous chromosomes within a cell, organized according to size and shape.
 (D) The set of unique physical characteristics that define an individual.
 (E) The collection of all the mutations present within the genome of an individual.
- (C) 24. What is the function of DNA polymerase III?
 (A) to rejoin the two DNA strands (one new and one old) after replication
 (B) to degrade damaged DNA molecules
 (C) to add nucleotides to the end of a growing DNA strand
 (D) to seal together the broken ends of DNA strands
 (E) to unwind the DNA helix during replication
- (B) 25. Phylogenetic trees are best described as _____.
 (A) true and inerrant statements about evolutionary relationships
 (B) hypothetical portrayals of evolutionary relationships
 (C) the closest things to absolute certainty that modern systematics can produce

- (D) theories of evolution
 (E) the most accurate representations possible of genetic relationships among taxa
- (B) 26. As cleavage continues during frog development, the size of the blastomeres _____.
 (A) increases as the number of the blastomeres increases
 (B) decreases as the number of the blastomeres increases
 (C) decreases as the number of the blastomeres decreases
 (D) increases as the number of the blastomeres stays the same
 (E) increases as the number of the blastomeres decreases
- (C) 27. Which of the following best describes resource partitioning?
 (A) Two species can coevolve to share the same niche.
 (B) Competitive exclusion results in the success of the superior species.
 (C) Slight variations in niche allow similar species to coexist.
 (D) A climax community is reached when no new niches are available.
 (E) Differential resource utilization results in the decrease in species diversity.
- (E) 28. The producers in aquatic ecosystems include organisms in which of the following groups?
 (A) photoautotrophs (B) plants (C) alga (D) cyanobacteria
 (E) A, B, C, and D are all correct
- (E) 29. Overexploitation encourages extinction and is most likely to affect _____.
 (A) most organisms that live in the oceans
 (B) terrestrial organisms more than aquatic organisms
 (C) edge-adapted species
 (D) animals that occupy a broad ecological niche
 (E) large animals with low intrinsic reproductive rates
- (D) 30. You are observing a population of lizards when you notice that the number of adults has increased and is higher than previously observed. One explanation for such an observation would include _____.
 (A) increased birth rate (B) decreased emigration (C) increased emigration
 (D) increased immigration (E) reduction in death rate
- (C) 31. Which of the following pair of hormones have antagonistic effects?
 (A) thyroid hormone and parathyroid hormone (B) epinephrine and norepinephrine
 (C) glucagon and insulin (D) prolactin and oxytocin
 (E) androgen and estrogen
- (D) 32. Which of the following is true of members of the phylum Cnidaria?
 (A) They are not capable of locomotion because they lack true muscle tissue.
 (B) They are primarily filter feeders.
 (C) They have either, or both, of two body forms: mobile polyps and sessile medusae.
 (D) They may use a gastrovascular cavity as a hydrostatic skeleton.
 (E) They are the simplest organisms with a complete alimentary canal (two openings).
- (A) 33. The enzyme amylase can break glycosidic linkages between glucose monomers only if the monomers are in the α form. Which of the following could amylase break down?
 (A) glycogen, starch, and amylopectin (B) glycogen and cellulose
 (C) cellulose and chitin (D) starch and chitin
 (E) starch, amylopectin, and cellulose
- (E) 34. Which of the following statements about intermediate filaments is **NOT TRUE**?
 (A) They are cytoskeletal fibers with a diameter of 8-12 nm.
 (B) Their constituent proteins are highly heterogeneous and express in a cell-type specific manner.
 (C) Their main function is to maintain cell shape and anchor organelles such as mitochondria.
 (D) They also express in nucleus and form nuclear lamina.
 (E) Vesicle can travel along intermediate filaments through interaction with motor proteins.
- (D) 35. Which of the following statements about glycolysis is **NOT TRUE**?
 (A) Glycolysis takes place in cytosol.
 (B) The ATP made during glycolysis is generated by substrate-level phosphorylation.
 (C) Glycolysis will proceed in eukaryotic cells whether oxygen is present or absent.
 (D) During glycolysis, when glucose is catabolized to pyruvate, most of the energy of glucose is

- transferred to ADP, forming ATP.
- (E) In addition to ATP, the end products of glycolysis are NADH and pyruvate.
- (B) 36. About Calvin cycle, which of the following statement is true?
- (A) reactions occur within the thylakoid membrane.
 (B) carbon fixation catalyzed by rubisco is the first step of the reaction.
 (C) reaction includes split water and release of oxygen.
 (D) the cycle builds sugar from smaller molecules by using ATP and the reducing power of electrons carried by NADH.
 (E) photophosphorylation occurs and generates ATP.
- (D) 37. About mitosis and meiosis, which statement is **NOT TRUE**?
- (A) Mitosis conserves the number of chromosome sets, producing cells that are genetically identical to the parent cell.
 (B) Meiosis reduces the number of chromosomes sets from two (diploid) to one (haploid), producing cells that differ genetically from each other and from the parent cell.
 (C) Meiosis occurs in reproductive cells, forming female and male haploid gametes.
 (D) DNA replication occurs twice in meiosis but once in mitosis.
 (E) Cell divides twice in meiosis but once in mitosis.
- (C) 38. The first cloned cat, called Carbon Copy, was a calico, but she looked significantly different from her female parent. Why?
- (A) The environment, as well as genetics, affects phenotypic variation.
 (B) Fur color genes in cats are influenced by differential acetylation patterns.
 (C) X inactivation in the embryo is random and produces different patterns.
 (D) Cloned animals have been found to have a higher frequency of transposon activation.
 (E) The telomeres of the parent's chromosomes were shorter than those of an embryo.
- (D) 39. The leading and the lagging strands differ in that
- (A) synthesize leading strands require RNA primer, but synthesize lagging strands do not require RNA primer.
 (B) the leading strand is synthesized by adding nucleotides to the 3' end of the growing strand, and the lagging strand is synthesized by adding nucleotides to the 5' end.
 (C) the lagging strand is synthesized continuously, whereas the leading strand is synthesized in short fragments that are ultimately stitched together.
 (D) the leading strand is synthesized in the same direction as the movement of the replication fork, and the lagging strand is synthesized in the opposite direction.
 (E) the leading strand is synthesized at twice the rate of the lagging strand.
- (B) 40. About split gene and RNA splicing, which of the following statements is **NOT TRUE**?
- (A) The coding regions are called exons because they are expressed and usually translated into proteins.
 (B) The other regions called introns. They are noncoding regions, which contain intervening sequences that are nonfunctional.
 (C) RNA splicing removes introns and joins exons, creating an mRNA molecule with a continuous coding sequence.
 (D) Alternative RNA splicing is a type of eukaryotic gene regulation in which different RNA molecules are produced from the same primary transcript, depending on which RNA segments are treated as exons and which as introns.
 (E) Alternative RNA splicing produces a number of different proteins called isoforms from a single gene, therefore significantly expand the repertoire of an eukaryotic genome.
- (A) 41. Which of the followings were probably considered the first terrestrial organisms?
- (1) burrowers (2) photosynthetic (3) multicellular (4) prokaryotes
 (5) eukaryotes (6) plants and their associated fungi
- (A) 2 and 4 (B) 3 and 5 (C) 1, 3, and 5 (D) 2, 3, and 6 (E) 2, 3, 5, and 6
- (B) 42. Which *two* structures play direct roles in permitting bacteria to adhere to each other, or to other surfaces?
- (1) capsules (2) endospores (3) fimbriae

- (4) plasmids (5) flagella
- (A) 1 and 2 (B) 1 and 3 (C) 2 and 3 (D) 3 and 4 (E) 3 and 5
- (B) 43. Which two genera have members that can evade the human immune system by frequently changing their surface proteins?
 (1) *Plasmodium* (2) *Trichomonas* (3) *Paramecium*
 (4) *Trypanosoma* (5) *Entamoeba*
- (A) 1 and 2 (B) 1 and 4 (C) 2 and 3 (D) 2 and 4 (E) 4 and 5
- (D) 44. Which of the following cells or structures are associated with *asexual* reproduction in fungi?
 (A) ascospores (B) basidiospores (C) zygosporangia (D) conidiophores (E) ascocarps
- (E) 45. Which of the following is **NOT** a function of rhizobacteria?
 (A) produce hormones that stimulate plant growth
 (B) produce antibiotics that protect roots from disease
 (C) absorb toxic metals
 (D) carry out nitrogen fixation
 (E) supply growing roots with glucose
- (E) 46. Epiphytes are _____
 (A) fungi that attack plants.
 (B) plants that have a symbiotic relationship with fungi.
 (C) nonphotosynthetic parasitic plants.
 (D) plants that live in poor soil and digest insects to obtain nitrogen.
 (E) plants that grow on other plants but do not obtain nutrients from their hosts.
- (C) 47. What do Wernicke's and Broca's regions of the brain affect?
 (A) olfaction (B) vision (C) speech (D) memory (E) hearing
- (B) 48. According to Hamilton's rule,
 (A) natural selection does not favor altruistic behavior that causes the death of the altruist.
 (B) natural selection favors altruistic acts when the resulting benefit to the beneficiary, corrected for relatedness, exceeds the cost to the altruist.
 (C) natural selection is more likely to favor altruistic behavior that benefits an offspring than altruistic behavior that benefits a sibling.
 (D) the effects of kin selection are larger than the effects of direct natural selection on individuals.
 (E) altruism is always reciprocal.
- (E) 49. What is the single greatest threat to biodiversity throughout the biosphere?
 (A) overharvesting of commercially important species
 (B) introduced species that compete with native species
 (C) pollution of Earth's air, water, and soil
 (D) disruption of trophic relationships as more and more prey species become extinct
 (E) habitat alteration, fragmentation, and destruction
- (A) 50. All of the followings belong to the Eumetazoa, **EXCEPT**
 (A) Proifera (B) Platyhelminthes (C) Mollusca (D) Annelida (E) Nematoda
- II. 【單選題】51-75 題，每題 2 分，共計 50 分。答錯 1 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。**
- (B) 51. About hormonal circuits that link kidney function, which of the following statements is **INCORRECT**?
 (A) An increase in blood osmolarity triggers the release of antidiuretic hormone (ADH), which helps to conserve water.
 (B) ADH increases water reabsorption in the descending limb of the Loops of Henle.
 (C) The Renin-Angiotensin-Aldosterone System (RAAS) is part of a complex feedback circuit that functions in the maintenance of blood pressure and volume.
 (D) A drop in blood pressure near the glomerulus causes the juxtaglomerular apparatus (JGA) to release the enzyme renin.
 (E) Renin triggers the formation of the peptide angiotensin II, which increases blood volume and

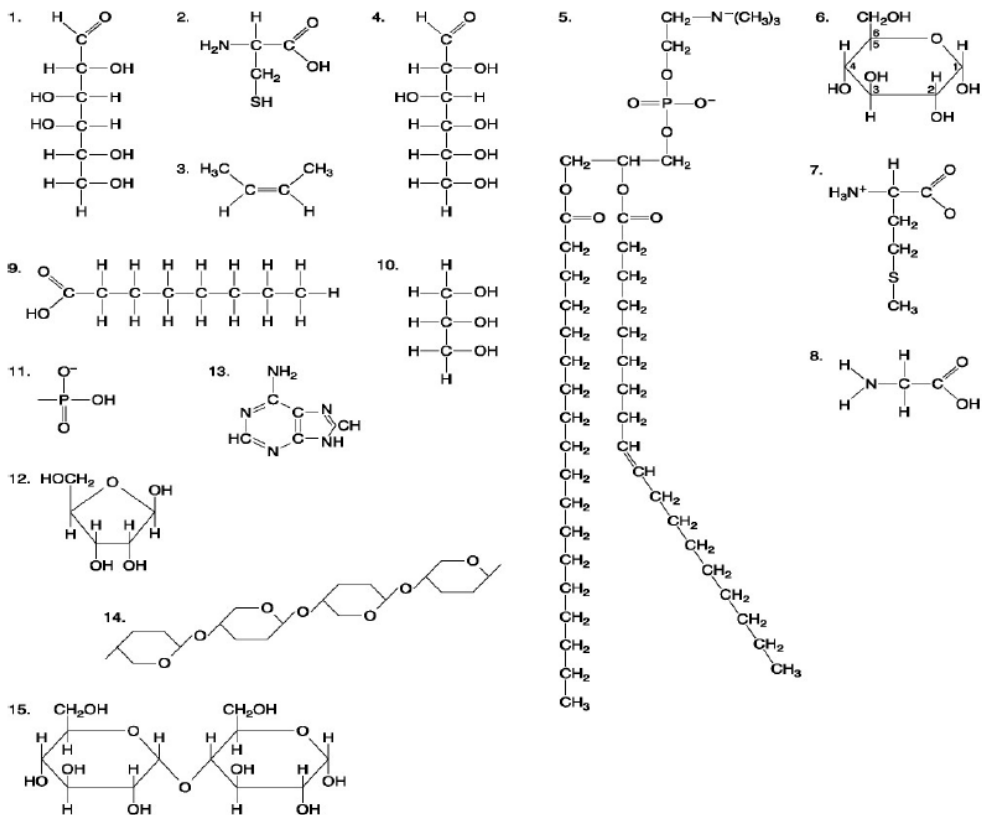
pressure by stimulating the release of aldosterone.

- (C) 52. About respiratory pigment, which of the following statements is **INCORRECT**?
- (A) Respiratory pigments are proteins that transport oxygen and greatly increase the amount of oxygen that blood can carry.
 - (B) Arthropods and many molluscs have hemocyanin with copper as the oxygen-binding component.
 - (C) Hemoglobin is involved in the transport of O₂ but not CO₂.
 - (D) A small change in the partial pressure of oxygen can result in a large change in delivery of O₂.
 - (E) CO₂ produced during cellular respiration lowers blood pH and decreases the affinity of hemoglobin for O₂; this is called the Bohr shift.
- 說明：本題需選擇錯誤之答案，(C)選項敘述明顯錯誤；依 CAMPBELL Biology 9th P.970 所述：Over the dissociation curve...amount of O₂. (D)選項則敘述正確。**
- (D) 53. Which of the followings would a paleontologist be most likely to do in order to determine whether a fossil represents a reptile or a mammal?
- (A) Look for the mammalian characteristics of a four-chambered heart and a diaphragm.
 - (B) Because mammals are eutherians, look for evidence of a placenta.
 - (C) Use molecular analysis to look for the protein keratin.
 - (D) Examine the teeth.
 - (E) Look for the presence of milk-producing glands.
- (D) 54. Which of the following statements about connective tissue is **INCORRECT**?
- (A) Loose connective tissue binds to epithelial to underlying tissues and holds organ in place.
 - (B) Fibrous connective tissue is found in tendons and ligaments.
 - (C) Three types of connective tissue fibers are collagenous fibers, reticular fibers and elastic fibers.
 - (D) Both cartilage and bones are connective tissues, but blood composed of blood cells and cell fragments in blood plasma is not.
 - (E) Fibroblasts that secret proteins of extracellular matrix are one major cell type in connective tissue.
- (E) 55. About human disorders due to chromosomal alterations, which of the following statements is **INCORRECT**?
- (A) Down's syndrome is an aneuploid condition that results from three copies of chromosome 21.
 - (B) Turner syndrome is the only known viable monosomy X in female human.
 - (C) Klinefelter syndrome is the result of an extra chromosome in a male producing XXY individuals.
 - (D) Certain cancers, including chronic myelogenous leukemia are caused by chromosome translocation.
 - (E) *cri du chat* ("cry of the cat") syndrome results from a specific duplication of chromosome 5.
- (B) 56. Which of the following description of the genetic term is **INCORRECT**?
- (A) Epistasis is a type of gene interaction in which the phenotypic expression of one gene alters that of another independently inherited gene.
 - (B) Codominance is a situation in which the phenotypes of heterozygotes is intermediate between the phenotypes of individuals homozygous for either allele.
 - (C) Pleiotropy is the ability of a single gene to have multiple effects.
 - (D) Epigenetic inheritance is the inheritance of traits transmitted by mechanisms not directly involving the nucleotide sequence of a genome.
 - (E) Polygenic inheritance is an additive effect of two more genes on a single phenotype.
- (C) 57. About cell membrane, which of the following statements is **NOT TRUE**?
- (A) Cell membranes are fluid mosaics of lipid and proteins, and the phospholipid bilayer is the basic building block of the membrane.
 - (B) Most of the phospholipids can shift about laterally in the plane of the membrane, but it is quite rare for phospholipids to flip-flop transversely across the membrane because the hydrophilic part of the molecule must cross the hydrophobic interior of the membrane.
 - (C) Phospholipids with saturated hydrocarbon tail pack more tightly, therefore decreasing membrane fluidity and viscosity.
 - (D) The presence of unsaturated hydrocarbon tails in phospholipids can enhance membrane fluidity, because unsaturated hydrocarbon tails cannot pack together as closely as saturated carbon tails.

(E) The steroid cholesterol in the plasma membrane of animal cells can change membrane fluidity and this effect is temperature-dependent.

說明：依 *CAMPBELL Biology* 9th P.174 Figure 7.8(a) 所述：Saturated hydrocarbon tails pack together, increasing membrane viscosity. 故 (C) 選項敘述會降低 membrane viscosity 是錯誤敘述。

(E) 58. Based on the following 15 molecules, which of the following statements is **NOT TRUE**?



- (A) 11, 12, and 13 could be linked together to form a nucleotide.
 (B) 5 is an important component of plasma membrane.
 (C) 2, 7, and 8 are molecules act as building blocks (monomers) of polypeptides.
 (D) 3 molecules of 9 and 1 molecule of 10 could be joined together to form a fat.
 (E) 11 and 13 could be joined together by a phosphodiester type of covalent bond.

(B) 59. About adrenal hormones, which of the following statements is **NOT TRUE**?

- (A) The adrenal medulla secretes catecholamines including epinephrine and norepinephrine.
 (B) Epinephrine and norepinephrine are secreted in response to stress-activated hormone cascade pathway via hypothalamus.
 (C) The adrenal cortex releases a family of steroids called corticosteroids in response to stress.
 (D) Humans produce two types of corticosteroids: glucocorticoids and mineralocorticoids.
 (E) Both glucocorticoids and mineralocorticoids play an important role in regulating blood pressure and volume.

說明：本題需選擇錯誤答案，因(B)選項的答案敘述明顯錯誤，故本題答案(B)。

(C) 60. Which description is correct about virus infectious diseases?

- (A) Human immunodeficiency virus (HIV) is a mosquito-borne retrovirus that cause acquired immunodeficiency syndrome (AIDS) of human.
 (B) Dengue virus has four serotypes that all are zoonoses pathogens that are transmitted from animal to human by vector mosquitoes.
 (C) Japanese encephalitis virus is a pathogen of zoonoses infectious disease that is transmitted

- between species from animal to human by vector mosquitoes.
- (D) H7N9 is an avian influenza virus also a subtype of influenza B virus.
- (E) Hepatitis B virus is a vector-borne virus that cause more than 80% infection in Taiwan.
- 說明：選項(A)HIV 及選項(E)B 型肝炎病毒皆非病媒傳染之病毒；(B)選項登革病毒並非經過動物傳染給人；(D)選項 H7N9 屬於 A 型流感病毒。所以上述有關病毒之描述皆不正確，故選項(C)有關日本腦炎病毒是人畜共同感染致病原為正確答案。**
- (E) 61. Which option listed in below is **INCORRECT** that describe about “ATP synthesis”?
- (A) H^+ ions flowing down their gradient enter a half channel in a stator, which is anchored in the membrane.
- (B) H^+ ions enter binding site within a rotor, changing the shape of each subunit so that rotor spins within the membrane.
- (C) Each H^+ ion makes one complete turn before leaving the rotor and passing through a second half channel in the stator into the mitochondrial matrix.
- (D) Spinning of the rotor causes an internal rod to spin as well. This rod extends like a stalk into the knob below it, which is held stationary by part of the stator.
- (E) Turning of the rod activates catalytic sites in the knob that produce ATP from AMP and Pi.
- (E) 62. Birds and mammals both have negative pressure breathing, but birds are more efficient because of which of the following reasons?
- (A) The bird’s mouth movements are able to force air into the lungs.
- (B) The tidal volume in birds is much larger than in a comparably sized mammal.
- (C) The flow of air in a bird’s lungs is from posterior to anterior.
- (D) The brain of the bird maximizes oxygen uptake more efficiently.
- (E) The maximum PO_2 is significantly higher in bird lungs.
- (A) 63. Choose the **INCORRECT** description regarding the hearing system of human.
- (A) The cochlea can distinguish volume because the basilar membrane is not uniform along its length.
- (B) The ear conveys information to the brain about two important sound variables that are volume and pitch.
- (C) Three bones of the middle ear transmit the vibrations to the oval window.
- (D) The cochlea has two large canals, an upper vestibular canal and a lower tympanic canal, which separated by a smaller cochlear duct.
- (E) The hearing system of human is a mechanoreceptor system.
- (B) 64. Which comment about “Global Climate Model” is **INCORRECT**?
- (A) Global climate patterns are determined largely by the input of solar energy and Earth’s movement in space.
- (B) Thermal energy from sunlight warms surface waters to whatever depth the sunlight penetrates, but the deeper waters remain quite cold.
- (C) Many features in the environment influence microclimate by casting shade, altering evaporation from soil, or changing wind patterns.
- (D) Climatic variables affect the geographic ranges of most plants and animals, any large-scale change in Earth’s climate profoundly affect the biosphere.
- (E) Climate pattern can be modified by many factors, including seasonal variation.
- 說明：(B)選項只是單純敘述水域環境的一般常見現象，沒有直接與全球氣候變遷有關。故本題答案無誤。**
- (D) 65. All of the followings have contributed to the diversity of organisms on the Hawaiian archipelago **EXCEPT** that
- (A) The islands are distant from the mainland. (B) Multiple invasions have occurred.
- (C) Adaptive radiation has occurred. (D) The islands are very young in geologic time.
- (E) Environmental conditions differ from one island to the next.
- (E) 66. What is systems biology approach?
- (A) is to define gene circuit and protein interaction network.
- (B) sequencing and analyzing whole genome sequence.

- (C) constructing a linkage map on the chromosome.
 (D) using bioinformatics tool to analyze gene expression and protein structure.
 (E) is attempt to integrate different levels of information in order to understand the operation of biological systems.
- (D) 67. The following events are steps of neural transmission at a chemical synapse. Please choose the correct sequence of events.
 (1) Neurotransmitter binds with receptors associated with the postsynaptic membrane.
 (2) Calcium ions rush into neuron's cytoplasm.
 (3) The ligand-gated ion channels open.
 (4) An action potential depolarizes the membrane of the axon terminal.
 (5) The synaptic vesicles release neurotransmitter into the synaptic cleft.
- (A) 1 → 2 → 3 → 4 → 5 (B) 2 → 3 → 5 → 4 → 1 (C) 3 → 2 → 5 → 1 → 4
 (D) 4 → 2 → 5 → 1 → 3 (E) 5 → 1 → 2 → 3 → 4
- (D) 68. Most of the dry weight of a plant is the result of uptake of _____.
 (A) carbohydrates in the root hairs and concentration in the root cortex
 (B) water and minerals through root hairs
 (C) water and minerals through mycorrhizae
 (D) CO₂ through stoma
 (E) CO₂ and O₂ through stomata in leaves
- (D) 69. A researcher is trying to construct a molecular-based phylogeny of the entire animal kingdom. Assuming that none of the following genes is absolutely conserved, which of the following would be the best choice on which to base the phylogeny?
 (A) genes involved in eye-lens synthesis (B) genes that cause radial body symmetry
 (C) genes involved in chitin synthesis (D) collagen genes
 (E) beta-catenin genes
- (A) 70. Carbon dioxide (CO₂) is released during which of the following stages of cellular respiration?
 (A) oxidation of pyruvate to acetyl CoA and the citric acid cycle
 (B) glycolysis and the oxidation of pyruvate to acetyl CoA
 (C) fermentation and glycolysis
 (D) the citric acid cycle and oxidative phosphorylation
 (E) oxidative phosphorylation and fermentation
- (×) 71. Species of amphibians belonging to the same genus occasionally mate, but their offsprings do not survive. This is an example of _____.
 (A) the postzygotic barrier called hybrid. (B) the prezygotic barrier called hybrid disjunction.
 (C) gametic isolation. (D) the postzygotic barrier called hybrid breakdown.
 (E) adaptative inviability.
- 說明：選項(A)the postzygotic barrier called hybrid 缺少 invariability，因敘述不完整故(A) 選項有誤，此題沒有正確答案。**
- (C) 72. A solution of starch at room temperature does not readily decompose to form a solution of simple sugars because _____.
 (A) starch hydrolysis is nonspontaneous
 (B) starch cannot be hydrolyzed in the presence of so much water
 (C) the activation energy barrier for this reaction cannot be surmounted
 (D) the hydrolysis of starch to sugar is endergonic
 (E) the starch solution has less free energy than the sugar solution
- (D) 73. When an individual is subject to short-term starvation, most available food is used to provide energy (metabolism) rather than building blocks (growth and repair). Which hormone would be particularly active in times of food shortage?
 (A) antidiuretic hormone (B) insulin (C) epinephrine
 (D) glucagon (E) oxytocin
- (D) 74. While sampling marine plankton in a lab, a student encounters large numbers of fertilized eggs. The student rears some of the eggs in the laboratory for further study and finds that the blastopore

becomes the mouth. The embryo develops into a trochophore larva and eventually has a true coelom. These eggs probably belonged to a(n) ____.

- (A) arthropod (B) nematode (C) echinoderm (D) mollusk (E) chordate
- (A) 75. How is habitat fragmentation related to biodiversity loss?
- (A) Populations of organism in fragments are smaller and more susceptible to extinction.
(B) The temperature in fragments rises to cause biodiversity loss.
(C) To keep biodiversity hot spot.
(D) Less absorption of carbon dioxide by plants in fragments.
(E) Environmental toxins are stable in fragments.