

1. 肽键是

The peptide bond is

- (a) $-\text{NH}_2$
- (b) $-\text{NH}-\text{CO}-$
- (c) $-\text{COOH}$
- (d) $-\text{NH}-\text{COOH}$
- (e) $-\text{NH}-\text{NH}-$

2. 对有关酸碱度(pH), 下面那一句说明是正确的

- (a) pH 是测量溶液中氢离子的浓度
- (b) 一个单位 pH 的改变等于 10 倍氢离子浓度的改变
- (c) 氢离子浓度的增加表示 pH 值的减少
- (d) 以上皆对
- (e) 以上皆错

Which of the following statements about pH is (are) true?

- (a) pH is a measurement of hydrogen ion concentration.
- (b) A single unit change on the pH scale is equivalent to a 10 times change in hydrogen ion concentration.
- (c) An increase in hydrogen ion concentration means a decrease in pH scale units.
- (d) All of the above are true
- (e) None of the above is true.

3. 细胞中的细胞核

- (a) 是由单层的核膜(membrane)所包围
- (b) 是存在核仁(nucleolus)内
- (c) 是细胞内核糖体(ribosomes)分解的区域
- (d) 含有细胞的DNA
- (e) 只有 b 和 d 是对

The nucleus of a cell

- (a) is surrounded by a single layer of membrane.
- (b) is contained within the nucleolus.
- (c) is the region of the cell where ribosomes are degraded.
- (d) contains the DNA of the cell.
- (e) both b and d.

4. 胰脏(pancreas)的主要消化作用为何?

- (a) 它产生消化酶(digestive enzymes)和胆盐(bile salt)
- (b) 它产生胆盐(bile salt)
- (c) 它产生消化酶(digestive enzymes)和丰富的碳酸氢盐(bicarbonate)溶液
- (d) 它产生含有碳酸氢盐的黏液(mucus)
- (e) 它协助胆固醇(cholesterol) 的控制

What is the main digestive function of the pancreas?

- (a) It produces digestive enzymes and bile salts.
- (b) It produces bile.
- (c) It produces digestive enzymes and a solution rich in bicarbonate.
- (d) It produces bicarbonate-containing mucus.
- (e) It aids in the control of cholesterol.

5. 下列那一种是糖酵解(glycolysis)的结果
- (a) 将 FAD 为还原 FADH₂
 - (b) 产生 CO₂
 - (c) 转变一个葡萄糖分子为两个三碳化合物分子(three-carbon compound)
 - (d) 每一个葡萄糖分子共消耗两个 ATP
 - (e) 将 NADH 转变成 NAD⁺

Which of the following is a result of glycolysis?

- (a) reduction of FAD to FADH₂
- (b) production of CO₂
- (c) conversion of glucose to two three-carbon compounds
- (d) a net consumption of two ATPs per glucose molecule
- (e) conversion of NADH to NAD⁺

6. 将空气从肺部吸入和呼出的过程称为
- (a) 气体交换 (gas exchange)
 - (b) 扩散作用 (diffusion)
 - (c) 呼吸 (breathing)
 - (d) 内呼吸作用 (internal respiratory)
 - (e) 空气新陈代谢 (air metabolism)

The process of moving air in and out of the lungs is called

- (a) gas exchange
- (b) diffusion
- (c) breathing
- (d) internal respiration
- (e) air metabolism

7. 将水份在植物木质部(xylem)往上推动的两种力量是
- (a) 蒸散牵引力(transpiration)和根压(root pressure)
 - (b) 根压和内聚力(cohesion force)
 - (c) 内聚力和蒸散牵引力
 - (d) 主动运输(active transport)和内聚力
 - (e) 蒸散牵引力和毛细管作用(capillary action)

The two main forces that move water upward in xylem are

- (a) transpiration and root pressure
- (b) root pressure and cohesion force
- (c) transpiration and cohesion force
- (d) active transport and cohesion force
- (e) transpiration and capillary action

8. 下面何者不是组织胺(histamine)的立即作用?
- (a) 引起局部血管扩张(dilate)
 - (b) 引起局部血管产生漏洞 (leakier)
 - (c) 增加部分区域的血液流量 (blood flow)
 - (d) 增加体血压 (systemic blood pressure)
 - (e) 引起局部组织肿胀 (swelling)

Which of the following is *not* an immediate function of histamine?

- (a) causing local blood vessels to dilate
 - (b) causing local blood vessels to become leakier
 - (c) increasing blood flow to the area
 - (d) increasing systemic blood pressure
 - (e) causing local swelling of the tissue
9. 当肾小球 (glomerulus) 进行压力过滤时, 下列何者不会从血液进入鲍氏囊(Bowman's capsule)?
- (a) 水
 - (b) 离子(ions)
 - (c) 糖(sugar)
 - (d) 血浆蛋白(plasma proteins)
 - (e) 胺基酸(amino acids)

During pressure filtration in the glomerulus, which of the following *does not* enter Bowman's capsule from the bloodstream?

- (a) water
 - (b) ions.
 - (c) sugar
 - (d) plasma proteins
 - (e) amino acids
10. 大部分动物当身体太热时, 下列何者为正常的生理反应?
- (a) 增加皮肤的血液流量
 - (b) 心跳降低
 - (c) 皮肤内的血管收缩
 - (d) 肌肉收缩
 - (e) 保留水分的消失

Which of the following is a physiological response that takes place in many animals when they get too hot?

- (a) increase blood flow to the skin
- (b) slowing of the heart rate
- (c) constriction of blood vessels in the skin
- (d) constriction of muscles
- (e) retention of water

11. 下列何者的结构不参与人体平衡的感觉(sense of balance)?

- (a) 内耳 (inner ear)
- (b) 半规管 (semicircular canals)
- (c) 感觉毛细胞 (hair cells)
- (d) 椭圆囊(utricle)
- (e) 基层膜 (basilar membrane)

Which of the following structure is *not* involved in the human sense of balance?

- (a) the inner ear
- (b) the semicircular canals
- (c) hairs cells
- (d) the utricle
- (e) the basilar membrane

12. 人体大脑中那部分负责协调身体的完整移动

- (a) 丘脑(thalamus)
- (b) 下丘脑(hypothalamus)
- (c) 脑干(brainstem)
- (d) 大脑(cerebrum)
- (e) 小脑(cerebellum)

Which part of the human brain is responsible for detailed coordination of movements?

- (a) thalamus.
- (b) hypothalamus.
- (c) brainstem.
- (d) cerebrum
- (e) cerebellum

13. 下列激素中何者调控植物顶芽(shoots)的向光性反应 (phototropic responses)?

- (a) 生长素(auxins)
- (b) 赤霉素(gibberellins)
- (c) 细胞分裂素(cytokinins)
- (d) 脱落酸(abscisic acid)
- (e) 乙烯(ethylene)

Which of the following types of hormones mediates the phototropic responses of shoots?

- (a) auxins
- (b) gibberellins
- (c) cytokinins
- (d) abscisic acid
- (e) ethylene

14. 在下列減数分裂(meiosis)过程中, 那阶段是染色体四分体(tetrads)排列在细胞中间?
- (a) 分裂间期 I (interphase I)
 - (b) 前期 I (prophase I)
 - (c) 中期 I (metaphase I)
 - (d) 后期 II (anaphase II)
 - (e) 中期 II (metaphase II)

During which of the following stages of meiosis are chromosome tetrads lined up in the centre of the cell?

- (a) interphase I
- (b) prophase I
- (c) metaphase I
- (d) anaphase II
- (e) metaphase II

15. 将遗传讯息从 DNA 转移至 RNA 的过程称为

- (a) 转译 (translation)
- (b) 转录 (transcription)
- (c) 启动 (initiation)
- (d) 延长 (elongation)
- (e) 复制 (replication)

The transfer of genetic information from DNA to RNA is called

- (a) translation
- (b) transcription
- (c) initiation
- (d) elongation
- (e) replication

16. 正常男人性染色体(sex chromosomes)的组成为何?

- (a) 两条 X 染色体
- (b) 两条 Y 染色体
- (c) 两条 X 染色体和一条 Y 染色体
- (d) 一条 X 染色体和一条 Y 染色体
- (e) 一条 Y 染色体

What is the normal complement of sex chromosomes in a human male?

- (f) two X chromosomes
- (g) two Y chromosomes
- (h) two X chromosomes and one Y chromosome
- (i) one X chromosome and one Y chromosome
- (j) one Y chromosome

17. 下列何者可利用作为基因重组(genetic recombination) 的运载体(vectors)?
- (a) 细菌质粒(bacterial plasmids)
 - (b) 操纵子(operons)
 - (c) 噬菌体(phages)
 - (d) 外显子(exons)
 - (e) a 和 c 皆是

Which of the following kinds of entity can serve as DNA vectors for genetic recombination?

- (a) bacterial plasmids
- (b) operons
- (c) phages
- (d) exons
- (e) both a and c

18. 利用基因工程(genetic engineering) 可作为生产下列何种产品?
- (a) 疫苗(vaccines)
 - (b) 人类胰岛素(human insulin)
 - (c) 人类生长激素(human growth hormone)
 - (d) 以上皆是
 - (e) 以上皆非

Genetic engineering techniques are used to produce which of the following products?

- (a) vaccines
- (b) human insulin
- (c) human growth hormone
- (d) all of the above
- (e) none of the above

19. 在热带雨林(tropical forest) 中植物的垂直结构(vertical structure)是因为需要得到大量的
- (a) 水分 (moisture)
 - (b) 氮气 (nitrogen)
 - (c) 二氧化碳 (carbon dioxide)
 - (d) 矿物质 (minerals)
 - (e) 阳光 (light)

The vertical structure of the tropical forest is due to the intense competition for

- (a) moisture.
- (b) nitrogen.
- (c) carbon dioxide
- (d) minerals
- (e) light

20. 下列何种情形人口增长率(population growth)会达到零增长?
- (a) 没有任何人超过两位小孩
 - (b) 夫妻平均孩子数目约为 2.25 时 (假定其中某些夫妻没有任何小孩)
 - (c) 没有任何人超过一位小孩
 - (d) 人口出生率等于 2.0
 - (e) 人口出生率等于人口死亡率

A human population will achieve zero population growth if

- (a) no one has more than two children
- (b) couple have an average of about 2.25 children each (to allow for the fact that some people have no child)
- (c) no one has more than one child
- (d) the birth rate equals to 2.0
- (e) the birth rate equals to the death rate

21. 在生态系统(ecosystems) 中, _____的流动是单向, 但_____是不断的被循环。

- (a) 矿物质(minerals)..... 能量(energy)
- (b) 遗传讯息(genetic information)..... 基因型(genotypes)
- (c) 有机化合物(organic compounds).....矿物质
- (d) 能量..... 物质(materials)
- (e) 食物..... 能量

In ecosystem, the flow of _____is one-way, while _____are constantly cycled.

- (a) minerals.....energy
- (b) genetic information.....genotypes
- (c) organic compounds.....minerals
- (d) energy.....materials
- (e) food.....energy

22. Endau Rompin 国家公园(National Park)在马来西亚国家那一州内?

- (a) 霹靂州 (Perak)
- (b) 彭亨州 (Pahang)
- (c) 柔佛州 (Johor)
- (d) 砂拉越州 (Sarawak)
- (e) 沙巴州 (Sabah)

Endau Rompin National Park is located at _____ state, Malaysia.

- (a) Perak
- (b) Pahang
- (c) Johor
- (d) Sarawak
- (e) Sabah

第廿七届全国华文独中数理学识比赛 生物科

23. 如果现在世界人口增加率不变，估计人口总人数达到 80 亿将会是何时
- (a) 2010
 - (b) 2020
 - (c) 2093
 - (d) 3150
 - (e) 几百万年后

If the current growth rate continues, it is projected that the human population will reach approximately 8 billion people by

- (a) 2010
 - (b) 2020
 - (c) 2093
 - (d) 3150
 - (e) a few million years from now
24. 蘑菇(mushroom) 可出现下列何种功能?
- (a) 产生孢子(spores)
 - (b) 产生接合孢子(zygotes)
 - (c) 真菌(fungus) 的营养(nutrition)
 - (d) 以上皆是
 - (e) 只有 a 和 b 是

Which of the following functions does a mushroom perform?

- (a) production of spores
 - (b) production of zygotes
 - (c) nutrition of the fungus
 - (d) all of the above
 - (e) both a and b
25. 所有生命体是
- (a) 由一个或多个细胞 (cell) 组成
 - (b) 含有多个同样的分子 (molecules)
 - (c) 进行多个同样的化学反应 (chemical processes)
 - (d) 遗传资料藏在 DNA 内
 - (e) 以上皆是

All organisms

- (a) are composed of one or more cells
- (b) contain many of the same molecules
- (c) carry out many of the same chemical processes
- (d) encode their genetic information in DNA
- (e) all of the above