

24-25医学生生命基础期末考

基础医学回忆卷

本卷共配置16道题，满分为100分，时间2小时

选择题

本部分一共有10道题，每题3分，共30分

1. 随着温度降低，蛋白质分子会逐渐靠近，若继续降温，肽链上的巯基($-SH$)会形成二硫键($S-S$)，升温后蛋白质分子会逐渐分开，但是二硫键会被保留。由以上信息，以下哪个选项是错误的：

- A. 巯基在氨基酸的R基上
- B. 冷冻和解冻前后蛋白质结构没有发生变化。
- C. 二硫键的形成不涉及肽键变化
- D. 抗冻植物对防止巯基氧化的能力更强

2. Viral genome sizes vary greatly, ranging from four genes to several hundreds of genes. The following features of viruses are most closely correlated with genome size:

- A. The size of the capsid
- B. RNA versus DNA genome type
- C. Whether the genome is double-stranded or single-stranded
- D. The complexity of glycoproteins on the capsid surface

3. Which of the following is derived from the ancestral cyanobacterium?

- A.** Chloroplast
- B.** mitochondrion
- C.** hydrogenosome
- D.** mitosome
- E.** The above two are correct

4. 关于细菌荚膜，以下说法错误的是：

- A.** 有免疫原性可以区分细菌
- B.** 使细菌会更耐受热
- C.** 抗吞噬
- D.** 机体内生成

5. The ventilation of the lungs during inhalation is:

- A.** A passive process
- B.** Driven by positive pressure
- C.** Caused by the downward movement of the diaphragm.
- D.** Caused by the outward movement of the rib cage.

E. An active process of forcing air into the lungs.

6. 关于Th1细胞对Tc细胞(CTL)的作用, 以下正确的是:

A. Th1分泌细胞因子促进CTL的增殖、分化

B. Th1促进CTL膜上MHC I类受体表达

C. Th1促进CTL膜上MHC II类受体表达

D. Th1促进CTL分泌穿孔素

7. Evolution adaptation in the diverse animals directedly exchange the matter between the cells and the enviroment include:

A. Gas exchange through simple diffusion, two-layered body structure.

B. Simplified internal composition, small cells with a high surface-area-to-volume ratio.

C. Small cells with rigid exoskeletons, two-layered body structure.

D. Large body volume, specialized structures such as wings for ventilation.

E. Thin epithelial membranes for efficient diffusion, reduced internal complexity.

注意: 本题非回忆题目, 由ChatGPT-4o with canvas 根据题干信息和有限的选项内容进行了二次生成, 请注意辨别

8. 关于人类进化的历程, 以下顺序正确的是:

- A.南方古猿-能人-直立人-智人
- B.南方古猿-直立人-能人-智人
- C.猿人-原始人-能人-直立人
- D.猿人-原始人-直立人-能人

9. In electrocardiogram:

- A. The QT indicates that the ventricular is contacting(systole)
- B. The QSR complex indicates that ventricular depolarization.
- C. The time between the heartbeats is approximatedly 8 milliseconds
- D. The heartbeat will be slow when we take vigorous activities.
- E. No information the electrocardiogram can provide

10. 关于人类的迁移，以下说法正确的是：

- A.人类的迁移增大的疾病的风向，这是人类“成长的烦恼”
- B.人类的迁移拓展生境，积累多样性，同时新的生境，也催生多样性
- C.个体的病患与痛苦，也是群体进化的适应性过程
- D.以上三个选项都是正确的

简答题

本部分一共有4道题，每道题10分，共40分

11. List 5 main processes by which cells communicate with each other in multicellular organisms. For each process state the key mechanism used to transfer information.
12. 2024年诺贝尔化学奖颁给了对蛋白质设计与预测做出重要贡献的科学家。请简述蛋白质一级结构与三级结构测序的常用方法，描述蛋白质预测和设计在生物医学领域的应用价值。
13. 以下文段来自于Nature Nov，请用中文简要概述（不需要逐字翻译）

The evolution of multicellular organisms from their ancestors marks a major transition in the history of life on earth. This transition was accompanied by fundamental development challenges such as generating diverse cell types, forming three dimensions tissues and establishing overall coordination to drive body plan formation. Asymmetric cell division contributes to cellular diversity and the formation of three dimensions tissues relies on the precise coordination of cell division, adhesion and signaling.
14. 列举出几个人类生物学属性与文化属性，并说出两者的本质特征

论述题

本部分一共有2道题，每道题15分，共30分

15. A scientist has discovered that a mutation in a specific gene leads to a reduction in the expression of a receptor on the cell membrane. How does this mutation decrease protein expression during the processes of protein synthesis, intracellular transport through the endomembrane system, and membrane localization? Additionally, outline the research methods you would employ to identify which stage is most significantly affected by this mutation.

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16. 如何理解人类虽然是最高等的生物，但是基因数量不是最多的？