

銘傳大學 99 學年度轉學生招生考試

生物科技學系

第三節

普通生物學試題

(第 1 頁共 3 頁) (限用答案本作答)

可使用計算機 不可使用計算機

一、選擇題：共 20 題，每題 2 分。

請作答時務必注意：1. 得標示清楚題號，題號標示不清，視為錯誤。

2. 如果你的答案連續四題是相同的，這四題視同全錯。

- Which of the following is a correct sequence of levels in life's hierarchy, proceeding downward from an individual animal?
A) brain, organ system, nerve cell, nervous tissue
B) organ system, nervous tissue, brain
C) organism, organ system, tissue, cell, organ
D) nervous system, brain, nervous tissue, nerve cell
E) organ system, tissue, molecule, cell
- Atoms can be represented by simply listing the number of protons, neutrons, and electrons – for example, $2p^+$; $2n^0$; $2e^-$ for helium. Which one of the lists represents the ^{18}O isotope of oxygen?
A) $6p^+$; $8n^0$; $6e^-$ B) $9p^+$; $9n^0$; $9e^-$
C) $8p^+$; $10n^0$; $8e^-$ D) $7p^+$; $2n^0$; $9e^-$
E) $10p^+$; $8n^0$; $9e^-$
- The bonds that broken when water vaporizes are
A) ionic bonds.
B) hydrogen bonds between water molecules.
C) covalent bonds between atoms within water molecules.
D) polar covalent bonds.
E) nonpolar covalent bonds.
- Which of the following hydrocarbons has a double bond in its carbon skeleton?
A) C_3H_8 B) C_2H_6 C) CH_4
D) C_2H_4 E) C_2H_2
- Which term includes all others in the list?
A) carbohydrate B) monosaccharide
C) disaccharide D) polysaccharide
E) starch
- Which cell would be best studying lysosomes?
A) muscle cell B) nerve cell
C) leaf cell of a plant D) bacterial cell
E) phagocytic white blood cell
- Consider this pathway: epinephrine \rightarrow G protein-coupled receptor \rightarrow G protein \rightarrow adenylyl cyclase \rightarrow cAMP. Identify the second messenger.
A) cAMP B) G protein
C) GTP D) adenylyl cyclase
E) G protein-coupled receptor
- Which of the following does not occur during mitosis?
A) condensation of the chromosomes
B) replication of the DNA
C) separation of sister chromatids
D) spindle formation
E) separation of the spindle poles
- How many different combinations of maternal and paternal chromosomes can be packaged in gametes made by an organism with a diploid number of 8 ($2n = 8$)?
A) 2 B) 4 C) 8 D) 16 E) 32
- Which of the following characteristics, structure, or processes is common to both bacteria and viruses?
A) metabolism B) ribosomes
C) genetic material composed of nucleic acid
D) cell division
E) independent existence

銘傳大學 99 學年度轉學生招生考試

生物科技學系

第三節

普通生物學試題

(第 2 頁共 3 頁) (限用答案本作答)

可使用計算機 不可使用計算機

11. One of the characteristics of retrotransposons is that
- A) they code for an enzyme that synthesizes DNA using an RNA template.
 - B) they are found only in animal cells.
 - C) they generally move by a cut-and-paste mechanism.
 - D) they contribute a significant portion of the genetic variability seen within a population of gametes.
 - E) their amplification is dependent on a retrovirus.
12. DNA sequences in many human genes are very similar to the sequences of corresponding genes in chimpanzees. The most likely explanation for this result is that
- A) humans and chimpanzees share a relatively recent common ancestor.
 - B) humans evolved from chimpanzees.
 - C) chimpanzees evolved from humans.
 - D) convergent evolution led to the DNA similarities.
 - E) humans and chimpanzees are not closely related.
13. In a root, a vessel element completes its development in which area of growth?
- A) zone of cell division
 - B) zone of elongation
 - C) root cap
 - D) zone of differentiation
 - E) apical meristem
14. A plant cell with a Ψ_s of -0.65 MPa maintains a constant volume when bathed in a solution that has a Ψ_s of -0.30 MPa and is in an open container. The cell has a
- A) Ψ_p of $+0.65$ MPa
 - B) Ψ_p of $+0.35$ MPa
 - C) Ψ of $+0.65$ MPa
 - D) Ψ of 0 MPa
 - E) Ψ_p of $+0.35$ MPa
15. Carnivorous adaptations of plants mainly compensate for soil that has a relatively low content of
- A) potassium
 - B) nitrogen
 - C) calcium
 - D) water
 - E) phosphate
16. A plant that has small, green petals is most likely to be
- A) bee-pollinated
 - B) bird-pollinated
 - C) wind-pollinated
 - D) bat-pollinated
 - E) moth-pollinated
17. Charles and Francis Darwin discovered that
- A) auxin is responsible for phototropic curvature.
 - B) auxin can pass through agar.
 - C) light destroys auxin.
 - D) light is perceived by the tips of coleoptiles.
 - E) red light is most effective in causing phototropic curvatures.
18. The epithelium best adapted for a body surface subject to abrasion is
- A) simple squamous
 - B) simple cuboidal
 - C) simple columnar
 - D) stratified squamous
 - E) stratified columnar
19. The mammalian trachea and esophagus both connect to the
- A) large intestine
 - B) rectum
 - C) stomach
 - D) epiglottis
 - E) pharynx
20. Blood returning to the mammalian heart in a pulmonary vein drains first into the
- A) vena cava
 - B) left atrium
 - C) right atrium
 - D) left ventricle
 - E) right ventricle

銘傳大學 99 學年度轉學生招生考試

生物科技學系

第三節

普通生物學試題

(第 3 頁共 3 頁) (限用答案本作答)

可使用計算機 不可使用計算機

二、問答題：共 10 題，每題 6 分。

答題得標示清楚題號(含)，同一題內的小題也得標示清楚，標示不清者不予計分。
不需照題號順序作答。

1. 胺基酸(amino acid)

- A) 請繪圖寫出共同之構造。
- B) 生物體共同胺基酸有幾種？
- C) 在中性溶液中(B)有可分為哪幾類？

2. 請說明膜蛋白(membrane proteins)有哪些功能？

3. 酵素(enzyme)的抑制劑分別為下列兩類，請分別詳加說明。

- A) competitive inhibitors
- B) noncompetitive inhibitors

4. A) 請加以說明呼吸作用中的 oxidative phosphorylation。

- B) 一莫耳的葡萄糖在呼吸作用的過程，經由 oxidative phosphorylation 最大值可釋出多少莫耳 ATP？

5. 下面小題都是光合作用(photosynthesis)的題目：

- A) 能源為何？
- B) 原料為何？
- C) 由何者吸收能源？
- D) 經由 linear electron flow 產物為何？
- E) Colvin cycle 用掉哪些物質？
- F) 產物為何？

6. 請解釋下列與遺傳(inheritance)有關的小題：

- A) Mendel's law
- B) Barr body
- C) linked genes

7. 請回答下列與遺傳物質有關的小題：

- A) 參與 DNA 複製的酵素有哪些？
- B) 說明 Telomeres。

8. 請說明下列小題：

- A) trnascrption
- B) RNA splicing
- C) tanslation

9. 請說明下列與 the regulation of gene expression 有關的小題：

- A) operator
- B) histone modifications
- C) enhancer

10. 請說明下列與 biotechnology 有關的小題：

- A) restriction enzymes
- B) PCR (the polymerase chain reaction)
- C) southern blotting

本試題係兩面印刷

試題完