臺灣綜合大學系統108學年度學士班轉學生聯合招生考試試題

科目名稱	普通生物學	類組代碼	A04.B04.C07.C08.D06
		科目碼	A0401

※本項考試依簡章規定各考科均「不可以」使用計算機　　本科試題共計 3 頁

I. 選擇題（單選，每題2分）　請於答案卷上作答，否則不予計分

1) Hydrogen bonding is most important in stabilizing the _____ structure of many proteins.
(A) tertiary
(B) secondary
(C) quaternary
(D) primary
(E) all of the above

2) Which of the following is true of glycolipids?
(A) Usually more than 10 sugar units are attached to the glycolipid.
(B) Fructose and sucrose are often part of glycolipids.
(C) Glycolipids contain phosphatidic acid.
(D) Laurate is a glycolipid.
(E) Glycolipids are usually found on the exterior surface of the plasma membrane.

3) Which of the following is least likely to be part of a cell membrane?
(A) phospholipids
(B) glycoproteins
(C) enzymes
(D) transport proteins
(E) proteoglycans

4) Which of the following processes would be most likely to occur in the Golgi complex?
(A) detoxification of drugs
(B) production and packaging of lipids
(C) synthesis of steroids
(D) glycosylation of proteins
(E) synthesis of DNA

5) Which organelle has only a single membrane around it?
(A) nucleus
(B) mitochondrion
(C) peroxisome
(D) chloroplast
(E) ribosome

6) A(n) _____ is composed of tetrameric protofilaments.
(A) extracellular matrix
(B) microfilament
(C) bacteriophage
(D) microtubule
(E) intermediate filament

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7) Under the conditions of a given reaction, a positive $\Delta G'$ means
(A) work can be done.
(B) the reaction is spontaneous.
(C) the reaction will not occur.
(D) no energy needs to be added.
(E) the reaction is at equilibrium.

8) Which of the following is NOT an allosteric inhibitor of an enzyme in the glycolytic pathway?
(A) glucose-6-phosphate
(B) citrate
(C) acetyl CoA
(D) ATP
(E) fructose-2,6-bisphosphate

9) β-oxidation
(A) is the second step in the oxidation of glucose.
(B) is a process used to oxidize fatty acids.
(C) is a process used to digest some polysaccharides.
(D) occurs in the cytoplasm.
(E) both B and C

10) $NADP^+$ is the coenzyme of choice in _____ reactions while NAD^+ is the coenzyme of choice in _____ reactions.
(A) anabolic; catabolic
(B) anabolic; both catabolic and anabolic
(C) catabolic; anabolic
(D) both catabolic and anabolic; catabolic
(E) metabolic; anabolic

11) Which of the following products CANNOT be used in the Calvin cycle?
(A) CO_2
(B) NADPH
(C) phosphoglycolate
(D) ribulose-1,5-bisphosphate
(E) 3-phosphoglycerate

12) Multiple sclerosis is a result of
(A) an immune system attack on nerve fibers.
(B) the absence of myelin on nerve cells.
(C) having excess acetylcholine receptors.
(D) excess amounts of myelin on nerve cells.
(E) blocking the nodes on Ranvier.

13) Catecholamines are synthesized by the
(A) adrenal gland.
(B) anterior pituitary gland.
(C) skeletal muscle.
(D) hypothalamus.
(E) liver.

背面有題，請繼續作答。

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14) The microtubule-organizing center (MTOC)
(A) acts as an anchor for both ends of the microtubule.
(B) is called a centrosome during interphase.
(C) is positioned near the cell membrane.
(D) is associated with two centrioles in plant cells.
(E) serves as a site for microtubule and microfilament assembly.

15) Collagens are associated with which of the following types of cellular junctions?
(A) gap junctions
(B) plasmodesmata
(C) adhesive junctions
(D) tight junctions
(E) none of the above

16) During the G2 checkpoint in eukaryotic cells, the cell is assessed with regard to
(A) nutrients.
(B) DNA replication.
(C) DNA damage.
(D) chromosome attachment to the spindle.
(E) presence of growth factors.

II. 問答題 (第 1-6 題, 每題 10 分. 第 7 題 8 分)

1. (a) Give 1 model organism that is multicellular.
(b) Describe the advantages of it.
(c) Describe the limitation of it.

2. Explain "CRISPR/Cas9" and give one application.

3. Give and explain 4 methods that can prevent transgene escape from genetically modified plants.

4. (a) Draw and describe the life cycle of HIV.
(b) Explain the principle of the cocktail therapy against HIV.

5. Give one experiment that tests natural selection. You should describe
(a) observation, (b) hypothesis, (c) experiment design, (d) result, and (e) significance.

6. Please briefly explain the biological function of the following terms.
(a) cohesins; (b) clathrin; (c) substrate-level phosphorylation; (d) caspases; (e) desmosomes.

7. How does a cell synthesize and degrade cAMP?