

# 亞洲大學

## 115 學年度學士後獸醫學系招生試題紙

| 學系別     | 考試科目      | 考試日期      | 時 間         |
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- Our species is called *Homo sapiens*. The first word refers to which taxonomical grouping?  
A) Kingdom    B) Phylum    C) Order    D) Genus
- What feature of genetic mutations can eventually lead to the evolution of new species?  
A) Mutations always produce harmful effects.  
B) Mutations never affect protein structure or function.  
C) Mutations are not a mechanism through which biological evolution occurs.  
D) Mutations produce changes in the DNA sequence of a gene.
- An example of one of the ways a pH buffer helps to maintain homeostasis is to  
A) increase the  $H^+$  concentration if pH decreases.  
B) reduce the  $H^+$  concentration if pH decreases.  
C) reduce the  $H^+$  concentration if pH increases.  
D) increase the  $OH^-$  concentration if pH increases.
- You have been given vials of  $H_2$ , Na,  $H_2O$ , Hg, and  $CH_4$ . What are the majority of your vials filled with?  
A) liquids at room temperature    B) gases    C) molecules    D) carboxyls
- What structural component makes fat an efficient macromolecule able to store high amounts of energy?  
A) A lipid's size is small and can easily be broken, down releasing high amounts of energy.  
B) Lipids have many long chains of C-OH bonds, which store high amounts of energy.  
C) Fats have long chains of C-H bonds, which store high amounts of energy.  
D) The way in which adipose tissues are structured is a way for a high amount of energy to be accessed easily.
- When placed in an aqueous solution, amphipathic molecules will orient themselves with  
A) hydrophobic hydrocarbon chains facing the water and hydrophilic head groups in the middle.  
B) hydrophilic hydrocarbon chains facing the water and hydrophobic head groups in the middle.  
C) hydrophilic hydrocarbon chains in the middle and hydrophobic head groups facing the water.  
D) hydrophobic hydrocarbon chains in the middle and hydrophilic head groups facing the water.
- The route that most accurately describes secretory protein movement through the endomembrane system would be  
A) Golgi apparatus→smooth endoplasmic reticulum→lysosome→vesicles→plasma membrane.  
B) plasmid→plasma membrane→nuclear envelope→smooth endoplasmic reticulum→vesicles.  
C) nuclear envelope→vesicles→Golgi apparatus→rough endoplasmic reticulum→plasma membrane.  
D) rough endoplasmic reticulum→vesicles→ Golgi apparatus→vesicles →plasma membrane.

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8. The signal recognition particle (SRP) functions in
  - A) recognizing an ER signal sequence and binding to an SRP receptor in the ER.
  - B) binding to a newly translated protein and escorting it to the cell membrane, the cytoplasm, or the Golgi.
  - C) determining the destination of a vesicle that buds from the Golgi.
  - D) marking an organelle for destruction by lysosomes.
9. Animal cells are permeable to water and urea but NOT to sucrose. Initially, the inside of a cell contains 1 M sucrose and 1 M urea and the outside 2 M sucrose and 1 M urea. After the system reaches equilibrium, what changes are observed?
  - A) The molarity of urea would be higher outside than inside the cell.
  - B) The molarity of sucrose would be similar inside and outside the cell.
  - C) Water would move out of the cell causing the cell to shrivel.
  - D) The molarity of sucrose would be similar inside and outside the cell and water would move out of the cell causing the cell to shrivel.
10. The plasma membrane
  - A) is composed of an extracellular and intracellular layer of phospholipids.
  - B) has extracellular and intracellular layers or leaflets that are highly symmetrical.
  - C) uses cholesterol as its primary lipid.
  - D) contains cellulose.
11. What happens next after the hormone glucagon binds to a G-protein coupled receptor (GPCR)?
  - A) The G-protein loses GDP and gains GTP becoming activated.
  - B) The G-protein loses GTP and gains GDP becoming activated.
  - C) The G-protein loses GDP and gains GTP becoming inactivated.
  - D) The G-protein loses GTP and gains GDP becoming inactivated.
12. Epinephrine blocks the contraction of muscles in the airways. Which of the other activities of epinephrine is most likely to be regulated by the same type of pathway?
  - A) promotes the breakdown of glycogen in skeletal muscle cells
  - B) inhibition of saliva production in salivary glands
  - C) stimulation of heart muscle cell contraction
  - D) increased sweating
13. In a developing human embryo, the hands and feet resemble mittens, with cells and tissues present between the fingers and toes. When a baby is born, these cells are not present, resulting in distinct fingers and toes. In the development of fingers and toes these cells were lost by
  - A) cell division.
  - B) cell connections.
  - C) cell morphology.
  - D) apoptosis.
14. The major macromolecules of the ECM are
  - A) polysaccharides and proteins.
  - B) polysaccharides and fat.
  - C) fat and proteins.
  - D) fat and nucleotides.

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15. Why is there a need to produce Okazaki fragments on the lagging strand, but not on the leading strand of DNA?

- The two parental strands of DNA are antiparallel and DNA polymerase makes DNA in the 5' to 3' direction only.
- It is substantially more efficient to make several shorter strands rather than one longer strand of DNA.
- There is not enough cellular DNA ligase for bonding Okazaki fragments together if they were produced from both parental strands.
- By having one leading strand and one lagging strand the cell can limit the amount of DNA polymerase used for chromosomal replication.

16. Which of the following statements best describes DNA polymerase?

- It is an enzyme required to produce a primer needed for DNA replication.
- It is an enzyme that catalyzes the addition of nucleotides to the 5' end of a growing DNA strand.
- It is an enzyme that catalyzes the addition of nucleotides to the 3' end of a growing DNA strand.
- It is an enzyme required to glue pieces of DNA fragments together.

17. Wild type bread mold can grow in a minimal medium without supplements, while certain mutated strains can only grow in a minimal medium that is supplemented with specific intermediates. See the figure below for an overview of the arginine biosynthetic pathway. A strain that can grow in a minimal medium containing arginine, but NOT in minimal media containing citrulline nor in minimal media containing ornithine would have a mutation in the gene that encodes for \_\_\_\_\_.

Precursor  $\xrightarrow{\text{Enzyme 1}}$  Ornithine  $\xrightarrow{\text{Enzyme 2}}$  Citrulline  $\xrightarrow{\text{Enzyme 3}}$  Arginine

- enzyme 1.
- enzyme 2.
- enzyme 3.
- both enzymes 1 and 3.

18. Which sequence of events CORRECTLY describes the initiation and elongation steps of translation in prokaryotic cells?

- (1) initiator tRNA binds start codon on mRNA
- (2) small ribosomal subunit binds to mRNA
- (3) large ribosomal subunit binds
- (4) tRNA entry and peptidyl transfer reaction
- (5) translocation of ribosome and release of tRNA

A) 1, 2, 3, 4, 5    B) 1, 2, 3, 5, 4    C) 1, 3, 2, 4, 5    D) 2, 1, 3, 4, 5

19. What is the first step in the production of a siRNA?

- infection with a virus
- transcription from a nuclear gene
- design of an experimental treatment
- cleavage to form a short double-stranded RNA

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20. The RNA sequences of some introns found in bacteria, mitochondria, chloroplasts, and some nuclear genes fold into 3-D structures that catalyze the removal of the introns. Therefore, the intron functions as a

A) ribozyme. B) enzyme. C) spliceosome. D) guide.

21. In *E. coli* cells, when lactose is absent from the environment,

A) large amounts of b-galactosidase, lactose permease, and galactosidetransacetylase are made.

B) trace amounts of b-galactosidase, lactose permease, and galactosidetransacetylase are made.

C) no b-galactosidase, lactose permease, and galactosidetransacetylase are made.

D) the *lac* operon is induced.

22. What happens when the cAMP-CAP complex binds the CAP site near the *lac* promoter?

A) Transcription rate decreases.

B) Transcription rate increases.

C) RNA polymerase binds to the promoter.

D) RNA polymerase binds to the promoter and transcription rate increases.

23. Sickle-cell anemia is a human disease that occurs as a result of what type of mutation in the *b*-globin gene?

A) silent B) missense C) nonsense D) frameshift

24. MAPK and MEK are intracellular signaling proteins that mediate cell division induced by growth factors. When mutations in the normal MAPK and MEK genes result in an abnormally high level of MAPK and MEK activity and an increased rate of cell division, then the mutated gene is called a(n)

A) spliceosome. B) transposon. C) tumor-suppressor gene. D) oncogene.

25. Colchicine is a toxin that binds to tubulin proteins and prevents microtubules from elongating. What effect might this have on dividing cells?

A) Cells will be able to complete mitosis, but cytokinesis will not occur.

B) Chromosomes will not be able to condense, so mitosis will not occur.

C) Sister chromatids will not be properly separated into separate daughter cells.

D) Replicated chromosomes will not be able to stick together, so sister chromatids will not properly sort into daughter nuclei.

26. A mutation occurs in a gene that encodes a G<sub>1</sub> cyclin, such that the protein is unable to bind to its CDK. How will this affect the cell cycle?

A) The cell will be stuck in G<sub>1</sub> and will not advance through the cell cycle.

B) The cell will replicate its DNA, but will be unable to progress through mitosis.

C) The cell will rapidly replicate its DNA and progress through mitosis, causing uncontrolled cell division, and leading to cancer.

D) The cell will proceed thru mitosis without replicating its DNA.

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27. Imagine in lemmings, that gray fur color (G) is dominant over white (g). There is another gene, called *color*, and individuals must have at least one "C" allele for gray color to be expressed. You obtain a white lemming that is heterozygous for gray fur color. What is its genotype?  
 A) ggcc    B) GgCC    C) Ggcc    D) ggCc

28. In mice, the gene for insulin-like growth factor is imprinted. During embryonic development, only the paternal allele for insulin-like growth factor is expressed. This means  
 A) that the paternal allele is imprinted.  
 B) that the maternal allele is imprinted.  
 C) that the paternal allele is hyper-methylated.  
 D) that the paternal allele is mutated.

29. Future kidney cells and heart cells can differentiate into their respective specialized cell types because  
 A) they express a different set of genes during development.  
 B) they possess different genes.  
 C) they arise from different embryonic stem cells.  
 D) they express different genes and utilize different transcription factors during development.

30. If a plasmid lacks an origin of replication what will happen when it is transformed into bacteria?  
 A) As the bacteria divide they will lose the plasmid.  
 B) Bacteria containing the plasmid will not be able to grow in the presence of antibiotics.  
 C) There will not be regions to clone genes into the plasmid.  
 D) The plasmid will not be useful in producing a protein because it lacks an RNA polymerase binding site.

31. The human b-globin gene has two alleles, H<sup>S</sup> and H<sup>A</sup>, individuals that are homozygous for H<sup>S</sup> have sickle-cell anemia and a lower fitness. Individuals that are heterozygotes (H<sup>S</sup>H<sup>A</sup>) do not show sickle-cell symptoms and have a resistance to malaria. Individuals that are homozygous for H<sup>A</sup> have the highest fitness but are susceptible to malaria. In areas where malaria is prevalent the H<sup>S</sup> allele is maintained in the population. Which type of selection is occurring with the b-globin gene?  
 A) stabilizing  
 B) directional  
 C) disruptive  
 D) balanced

32. You are currently studying the behavior and physiology of a vertebrate about which little is known. Based on what you know about other vertebrates, what would you predict would be the state of this animal when it was not in the fight or flight state.  
 A) Energy stores such as adipose tissue and glycogen are broken down to mobilize fatty acids and glucose.  
 B) The heart rate increases and airways are dilated to promote maximum oxygen intake.  
 C) Elevations in cortisol are needed to increase glucose.  
 D) Leptin levels are increased to enhance appetite.

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33. Which hormones counteract each other in regulating calcium homeostasis?

- antidiuretic hormone and aldosterone
- atrial natriuretic peptide and aldosterone
- parathyroid hormone and vitamin D (1,25 dihydroxyvitamin D)
- antidiuretic hormone and parathyroid hormone

34. Most allergy medicines contain antihistamines that block the actions of histamine. These drugs reduce cold symptoms by directly

- lysing virus-infected cells and preventing further propagation of the pathogen.
- stimulating components of the immune system through the release of cytokines.
- blocking or reducing the inflammation response in mucous membranes.
- stimulating the production of specific antibodies.

35. In mammalian defenses against invading pathogens, all of these are considered nonspecific defense mechanisms EXCEPT

- acquired immunity.
- the skin.
- mucous membranes.
- the inflammatory response.

36. Most innate immune responses rely on

- recognition of specific antigens.
- pathogens being engulfed and destroyed.
- plasma cells to secrete antibodies.
- IgM antibodies.

37. A green plant is first grown in blue light and then in green light. The likely outcome for photosynthesis in both phases is

- Increased plant growth in blue light and no plant growth in green light.
- No plant growth in blue light and increased plant growth in green light.
- Decreased plant growth in blue light and no plant growth in green light.
- No plant growth in blue light and decreased plant growth in green light.

38. Endosperm is

- sperm after it has entered the archegonium.
- nutritive tissue produced within antheridia.
- sperm cells enclosed within pollen grains.
- tissue stored in seeds that provides nutrition for embryos.

39. The apprentice in your horticulture lab accidentally trims all of the axillary buds from a particularly prized specimen. After realizing his mistake, he rather glumly asks you, as lead horticulturalist, about the effects on the plant. You predict that

- the plant will die rapidly from this loss.
- the plant will regrow the lost buds.
- the plant will continue its vertical growth and will be a tall and skinny variety.
- the plant will continue its horizontal spread and will be a wide but short variety.

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40. Plant roots that are in a horizontal position grow down because

- cells on the upper side elongate more than those on the lower side.
- auxins are stimulating cells on the lower side to elongate more.
- auxins are being pulled to the upper side.
- auxins are having no influence on this process.

41. Based on the fact that CO<sub>2</sub> limits photosynthesis in some current environments, what might you conclude about the evolution of photosynthesis?

- Photosynthesis evolved when environmental concentrations of CO<sub>2</sub> were low.
- Photosynthesis evolved when environmental concentrations of CO<sub>2</sub> were high.
- CO<sub>2</sub> levels likely did not have a bearing on the evolution of photosynthesis.
- Photosynthesis evolved in a greenhouse.

42. A turgid plant cell is one that

- lacks a cell wall.
- has an extra cell wall layer.
- lacks cytosol.
- has excess water in its cytosol.

43. Which of the following plant hormones stimulates development of an abscission zone in the leaf petiole?

- Ethanol
- gibberellins
- abscisic acid
- ethylene

44. Seeds for desert plants often germinate once abscisic acid is washed away from the seed by water. In this scenario, abscisic acid is acting as a/an

- hormone that stimulates cell expansion.
- germination-inhibiting compound.
- suspensor.
- hormone to induce the release of sugars from stored starch in the endosperm.

45. The influenza virus is typical of many animal viruses in that it has an envelope composed of lipids and glycoproteins. Which of the following statements about the envelope is ACCURATE?

- The envelope glycoproteins are encoded by genes found in the host genome.
- The envelope is inside the capsid.
- The envelope is obtained from the host cell when the virus buds from the plasma membrane.
- The envelope is obtained from the host cell upon entry into the cell.

46. You discover a bacteria species in a deep ocean sample that can turn olive oil into pure gold. The bacteria do not replicate well at sea level, and one night all of your "Golden" bacteria die. What can you do to possibly retrieve the gold-making gene from the dead Golden bacteria?

- Transform a live bacterial strain with the Golden bacteria's DNA.
- Transduce a live bacterial strain with the Golden bacteria's DNA.
- Conjugate a live bacterial strain with the Golden bacteria.
- Transduce the Golden bacteria and then infect a live strain of bacteria with the transducing virus.

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47. Pathogenic microorganisms and their hosts live in a close association with one another known as:  
 A) sociality    B) mutualism    C) parasitism    D) commensalism

48. You are studying the bacteria in the water of a nearby pond. From a 100 mL sample, you use a 0.5 mL subsample to inoculate a plastic dish filled with a semisolid nutrient medium that fosters growth of coliform bacteria. After an appropriate incubation period, you count 100 bacterial colonies growing on the surface of the medium. What conclusion can you make about the coliform bacteria in the pond water?  
 A) There is approximately one coliform bacterial cell per milliliter.  
 B) There are approximately 200 coliform bacterial cells per milliliter.  
 C) There is approximately one coliform bacterial species per milliliter.  
 D) There are approximately 200 coliform bacterial species per milliliter.

49. Consider a large algal colony like *Cladophora* or *Microcystis*, which plays host to a complex biofilm of bacteria. What is a specific benefit the algal host may receive from the relationship?  
 A) Oxygen    B) Vitamin B<sub>12</sub>    C) A physical habitat    D) Glucose

50. An individual human can be thought of as a \_\_\_\_\_, consisting of a host and a variety of microbes. DNA from saliva or fecal samples, for example, would reveal the DNA genomes of both the host and its symbiotic microbes, known together as the \_\_\_\_\_.  
 A) holobiont, hologenome    B) hologenome, holobiont  
 C) microbiome, microgenome    D) microbiome, hologenome

51. You are observing the embryonic development of a new species in your laboratory. This species has indeterminate development. You note a mutation in which one of the blastomeres (early cells) mutates and loses its function. What do you hypothesize would happen to this being?  
 A) Nothing—the remaining blastomeres would accommodate the formation of the necessary structures of the embryo.  
 B) Immediate embryo death—the remaining blastomeres could not accommodate the formation of the necessary structures of the embryo.  
 C) Uncertain future for the embryo—depending on which blastomere was lost, the remaining blastomeres might accommodate the formation of the necessary structures of the embryo.  
 D) The embryo would certainly lack some features as a result of the lost blastomere.

52. Molecular-based phylogenies place the phylum Platyhelminthes in the Protostomia. How do scientists best explain the morphological differences between flatworms and the other members of the Lophotrochozoa?  
 A) Modern Platyhelminthes do not have a coelom but did originate from an ancestor that had one.  
 B) The Platyhelminthes clade separated from other clades before coeloms evolved and consequently Platyhelminthes have never had a coelom.  
 C) Platyhelminthes originated from ancestors with a coelom and have retained it to the present time.  
 D) Platyhelminthes evolved from an ancestor without a coelom but developed one during the course of their evolution.

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53. A frog loses its ability to undergo buccal pumping. What must happen to compensate for this loss?

- The pumping of blood from the atria to the ventricle must increase.
- The exchange of gases through the skin must increase.
- The pumping of blood from the ventricle to the body must increase.
- The diffusion of wastes through the kidneys must increase.

54. Metamorphosis is

- changing of one body form to another within a species, such as the change from an aquatic tadpole to a terrestrial frog.
- an intermediate condition, such as length of legs in mice between longer legs of some mice and shorter legs in others, a condition caused by *Hox* genes.
- the developmental changing of a scale to a feather.
- the evolutionary transition from fishes to amphibians.

55. Which of the following would NOT be an example of negative feedback control in homeostasis?

- Blood volume and pressure drop due to minor bleeding. This decreased pressure causes the kidneys to increase water reabsorption to restore blood volume and pressure.
- Exposure to cold water causes body temperature to drop. Decreased stimulation of heat receptors causes constriction of blood vessels near the skin and better retention of heat.
- Glucose levels rise following consumption of a big dessert, triggering release of insulin which causes glucose levels to fall.
- During the birth process, stretch receptors in the uterus stimulate the release of oxytocin from the pituitary gland. This hormone stimulates uterine muscle contraction that increases stimulation of the stretch receptors.

56. Sucralose is a non-caloric artificial sweetener. Its structure is similar to sucrose, but with three of sucrose's hydroxyl groups replaced by chloride. How do you predict sucralose behaves in the body?

- Sucralose enters cells by diffusion.
- Sucralose is unable to bind conventional sugar transport mediators and is excreted.
- Sucralose binds to glucose transport mediators and is metabolized by normal metabolic pathways.
- Sucralose does not enter the body.

57. The inner mitochondrial membrane contains numerous inward folds called cristae, which greatly increase the surface area of this membrane. Because ATP is produced on the inner mitochondrial membrane, cristae enhance the ability of the mitochondria to generate ATP. What structure can be thought of as similar to these cristae?

- Spiracle
- Finger-like projections of a human's small intestine
- Bronchiole
- Cartilage

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58. The acetylcholine receptor is a ligand-gated channel that produces

- Depolarization by allowing  $\text{Na}^+$  ions to enter the muscle fiber.
- Hyperpolarization by allowing  $\text{Na}^+$  ions to exit the muscle fiber.
- Depolarization by allowing  $\text{Cl}^-$  ions to enter the muscle fiber.
- Depolarization by allowing  $\text{K}^+$  ions to leave the muscle fiber.

59. Teeth aren't exactly bones, but they're made up of similar tissues and are subject to the same problems bones may have. In what way(s) do you predict the disease rickets might affect teeth?

- Periodontal disease:** Redness and swelling elicited by bacterial infection of the gums.
- Delayed formation:** The baby teeth may not erupt until after one year. When they erupt, they may be smaller than normal.
- Increased likelihood of cavities:** Low vitamin C status prevents sufficient mineralization, allowing infection to establish on the teeth.
- Canker sores:** Painful mouth sores associated with bacteria and/or viruses.

60. Contraction of the muscles surrounding an arteriole that decreased its diameter by 50% would

- increase the resistance in the arteriole approximately 16-fold.
- decrease the resistance in the arteriole approximately 16-fold.
- increase the resistance in the arteriole by approximately 50%.
- decrease the resistance in the arteriole approximately 50%.

61. What formula correctly represents the behavior of  $\text{CO}_2$  in the blood?

- $\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{CO}_3 + \text{CO}$
- $\text{CO}_2 + \text{H}^+ \rightleftharpoons \text{HCO}_3^- \rightleftharpoons \text{H}_2\text{O} + \text{H}_2\text{CO}_3$
- $\text{CO}_2 + \text{HCO}_3^- \rightleftharpoons \text{H}^+ + \text{H}_2\text{O} + \text{H}_2\text{CO}_3$
- $\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{CO}_3 \rightleftharpoons \text{HCO}_3^- + \text{H}^+$

62. Which structure of the reproductive system is treated as needing special protection during hemorrhage, much like the brain or heart?

- Placenta
- Ovaries
- Testes
- Uterus

63. After an animal has a hemorrhage, where does the fluid portion of blood come from, as blood volume is restored?

- Interstitial fluid
- Bone marrow
- Intestines
- Stomach

64. Why is a drop in blood pressure potentially dangerous?

- Active cells, like those in the brain, need a continuous supply of oxygen and nutrients.
- Once pressure drops, it can take hours to increase it again.
- Low blood pressure leads to gas bubbles in the blood that can cause a stroke or the "bends".
- If pressure is not high enough, blood vessels collapse and can become stuck closed.

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65. What is peristalsis?

- A) a process of fat emulsification in the small intestine
- B) voluntary control of the rectal sphincters regulating defecation
- C) the transport of nutrients to the liver through the hepatic portal vein
- D) smooth muscle contractions that move food through the alimentary canal

66. Cats cannot synthesize the amino acid taurine. This means that in cats, taurine

- A) is not a required nutrient.
- B) is an essential amino acid.
- C) must be stored in cellular compartments.
- D) is not present in their normal diet.

67. "Gluconeogenesis" is the process in which

- A) glucose levels are increased in the blood through the breakdown of carbohydrates.
- B) glucose levels are decreased in the blood through the breakdown of carbohydrates.
- C) glucose levels are increased in the blood by synthesis of glucose from noncarbohydrate sources.
- D) glucose levels are decreased in the blood by synthesis of glucose from noncarbohydrate sources.

68. The energy expenditure of a mammal at rest, in the postabsorptive state, and at a standard temperature is referred to as its

- A) basal metabolic rate.
- B) standardized metabolic rate.
- C) baseline metabolic rate.
- D) activated metabolic rate.

69. The main DISADVANTAGE of excessive gluconeogenesis during prolonged postabsorptive periods is that

- A) continued protein breakdown can impair enzymatic activity and plasma membrane functions.
- B) carbohydrate buildup in the liver impairs its function.
- C) the brain is exposed to levels of glucose that are too high.
- D) tissues other than the brain increase glucose utilization.

70. Which of the following hormones stimulates uterine contractions during the birth process in mammals?

- A) oxytocin
- B) testosterone
- C) FHS
- D) chorionic gonadotropin

# 亞洲大學

## 115 學年度學士後獸醫學系招生試題紙

| 學系別     | 考試科目      | 考試日期      | 時 間         |
|---------|-----------|-----------|-------------|
| 學士後獸醫學系 | 生物學(含植物學) | 115.04.25 | 15:30-17:00 |

71. In female mammals, germ cells  
 A) are not produced until puberty. B) are arrested in meiosis I until puberty.  
 C) develop into fully mature gametes before birth. D) arrested in meiosis II until puberty.

72. Which of the choices lists the three phases of the ovarian cycle in the correct order?  
 A) follicular; luteal; ovulation B) follicular; proliferative; secretory  
 C) luteal; ovulation; secretory D) follicular; ovulation; luteal

73. Many small creatures that live in temporary puddles can reproduce asexually at least occasionally. Why might this be a useful strategy for a puddle-dweller?  
 A) Puddles are very stable environments, so well adapted creatures should maintain their genes without mixing.  
 B) A single individual can quickly populate a transient environment.  
 C) Using asexual reproduction increases genetic variety and thus adaptability.  
 D) In asexual reproduction, the mother can choose the best of each chromosome to make the ideal haploid individual.

74. A mutation in mice leads to overgrowth of the Sertoli cells, so they span across the diameter of the seminiferous tubules. What phenotype would you expect to see?  
 A) infertility due to lack of mature oocytes  
 B) overproduction of sperm, so they clog the bulbourethral gland  
 C) overproduction of testosterone  
 D) infertility due to lack of mature sperm entering the epididymis

75. A scientist is studying several areas along an elevation gradient. Her study involves prescribed burns (purposefully set, low-intensity fires) in the different areas, followed by a comparison of the type and abundance of organisms that colonize them over the next ten years. What scale best describes her study?  
 A) Physiological ecology B) Ecosystem ecology  
 C) Organismal ecology D) Community ecology

76. Most bird species that form flocks show a negative relationship between flock size and individual vigilance (i.e., the larger the flock, the less often an individual lifts its head to scan the surrounding environment). However, some bird species have shown a positive relationship between flock size and individual vigilance. The positive relationship is particularly strong when flocks are space-constrained, such as in small ponds or fields. What is the most likely explanation for this?  
 A) As flock size increases, the number of "cheaters" increases, so individuals must spend more time scanning for predators.  
 B) As flock size increases, the risk for interference and aggression between members increases, so individuals must scan for both conspecifics and predators.  
 C) As flock size increases, the risk of predation for any given member increases, so individuals must spend more time scanning for predators.  
 D) As flock size increases, mating opportunities decrease, so individuals must spend more time scanning for potential mates.

# 亞洲大學

## 115 學年度學士後獸醫學系招生試題紙

| 學系別                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 考試科目      | 考試日期      | 時 間         |
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| 學士後獸醫學系                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 生物學(含植物學) | 115.04.25 | 15:30-17:00 |
| <p>77. Lions, leopards, and other large terrestrial predators generally maintain well-defined territories. What kind of dispersion pattern would you expect this to produce?</p> <p>A) clumped<br/>B) clustered<br/>C) uniform<br/>D) random</p> <p>78. The nitrogen-limitation hypothesis states that organisms select food in terms of the nitrogen content of the tissue. Why might this be true?</p> <p>A) Because many consumers need large amounts of nitrogen; for example, animal tissue contains about 10 times as much nitrogen as plant tissue.<br/>B) Because most organisms are able to "fix" nitrogen more efficiently than plants.<br/>C) Because foods with lower nitrogen content are easier for consumers to digest, leading most organisms to seek out low nitrogen foods.<br/>D) Because high nitrogen levels are a key part of plant chemical defenses, resulting in organisms avoiding high nitrogen plants.</p> <p>79. Community A and Community B both have 54 beetle species, but Community A has more total individuals than Community B. If you were to calculate the Shannon diversity index for both communities, what would be the result?</p> <p>A) Community B would have a higher Shannon index value.<br/>B) Community A would have a higher Shannon index value.<br/>C) Community A and B would have equal values for the Shannon index.<br/>D) Cannot predict the result based on this information.</p> <p>80. In the northeastern Pacific ocean, sea otters occur at a relatively low abundance. By preying upon sea urchins, sea otters maintain underwater kelp (large algae) "forests", which would otherwise be decimated by the herbivorous sea urchins. The kelp forests supply food for a wide variety of marine organisms, as well as providing refuge from predation and nursery habitat for juveniles. Based on this, what type of species best describes sea otters?</p> <p>A) indicator species<br/>B) flagship species<br/>C) keystone species<br/>D) dominant species</p> |           |           |             |