國立彰化師範大學 96 學年度博士班招生考試試題

系所：共同　　科目：英文

☆☆請在答案紙上作答☆☆　　

I. Questions 1-10 are based on Reading Passage 1. (20%)

Passage 1

Lean Time

Europe's pig farmers are eyeing Denmark with alarm.

1. Aside from shedding looser dung than usual, most of Denmark's pigs have painlessly made the transition to a diet without growth-promoting antibiotics, says the Danish pig industry. But if the rest of Europe followed suit, the cost would be crippling. The extra $1 or so per pig would be a blow to Europe's beleaguered pig farmers, who are already losing as much as $10 for each animal they sell into a world pork market that has collapsed.

2. Denmark's pig farmers agreed to ban growth promoters altogether on 1st January following steady reductions since 1995. The ban was designed to allay fears after a Danish report argued that growth-promoting antibiotics might encourage the development of antibiotic-resistant "superbugs" that spread from farms to hospitals.

3. Although there's no firm proof that this is the case, the European Union last year banned four major growth promoters because bacteria resistant to them might also be resistant to closely related antibiotics prescribed by doctors. Four promoters are still on sale, however, and are used throughout Europe except in Denmark and also Sweden, which banned them in the early 1990s. Pig farmers elsewhere are likely to see the report as a slick sales pitch by the Danes.

4. In a report published this week, the Danish Bacon and Meat Council claims that the transition was much smoother than they expected. Nor did the pigs become sicker, as predicted by the ban's opponents, a problem they said would

increase the use of antibiotics for treating infections in the animals.

5. Inspectors from the council monitored 62 Danish pig farms where antibiotics had already been phased out. "No corresponding increase in the therapeutic or prophylactic use of antibiotics has occurred during or since the removal of growth promoters farm feed," says the report. "The disaster people predicted hasn't materialised," adds Verner Wheelock, its author.

6. Of the 62 farms monitored, 38 reported few or no problems making the change. Twenty-four had problems with diarrhoea, especially among younger "weaner" pigs. But these problems were mostly temporary, and could be solved by changing the animals' diet to reduce ingredients such as peas, rapeseed, rye and coconut cakes, and using coarser meal containing more barley and small quantities of copper.

7. Infections were avoided by changes in husbandry. By rearing pigs in batches, for example, sheds could be thoroughly cleaned before the next batch came along.

8. But the cost of the changes is probably too high for many pig farmers, up to $20 million, or $1 per pig. Nearly a third of that cost came about because the animals grew slightly more slowly.

9. Although farmers sell pigs for around $60 each, many are already losing $10 per animal, and won't take kindly to additional costs. British farmers have been particularly badly hit, forced by strict domestic legislation to invest in welfare measures not required elsewhere in Europe. "It's cost them a lot of money, and pig farmers are losing money, so it's not the time to ask them to increase overheads or make capital investments," says Roger Cook of the National Office of Animal Health, an organisation representing British manufacturers of veterinary antibiotics.

Reading Passage 1 has 9 paragraphs. From the list of headings below, choose the most suitable heading for paragraphs 1-9. Write the appropriate letters (A-L) on your answer sheet.

Headings

A. Problems which won't last long
B. Responding differently to the report
C. The report is not available
D. What brought about the change
E. Close inspection is demanded
F. A smooth but costly transition
G. A report on the good result
H. Another way to avoid infection
I. Farmers have to pay more
J. What is the cost
K. They can't afford the change
L. The report is supported by hard evidence

1. Paragraph 1
2. Paragraph 2
3. Paragraph 3
4. Paragraph 4
5. Paragraph 5
6. Paragraph 6
7. Paragraph 7
8. Paragraph 8
9. Paragraph 9
10. What is the purpose of this article?
    A. To convince readers that the transition in Denmark is entirely successful.
    B. To give a report of a study on Danish pig farms.
    C. To give an overview of the transition and its influence.
    D. To demonstrate the process of the transition.

II. Questions 11-18 are based on Reading Passage 2. (16%)

Passage 2

Moon Magic

1. Why does the Moon seem so much bigger when it's near the horizon than when it's high in the sky? Although scientists have known since ancient times that this is an illusion, they have not agreed on an explanation. Now, an experiment with fake moons may have settled the debate.

2. The traditional explanation of the Moon illusion is that objects on the horizon give the brain points of reference that suggests the Moon is very distant. But when the Moon is high in the sky, the brain reacts to the lack of visual cues by thinking it is nearer. Because a distant object that covers the same area on the retina must be bigger, the brain concludes that the horizon Moon is huge.

3. But that theory fails to explain why the big low-lying Moon looks closer, not farther away. In the 1960s, psychologists explained this by suggesting that the eyes tend to focus on foreground objects when viewing a horizon Moon, but relax towards infinite focus when looking at the Moon in an empty sky. The brain interprets the relaxed focus as meaning that the Moon is very distant — and because the most distant objects look small, perceives the Moon as being small too.

4. To resolve the issue, Lloyd Kaufmen, a psychologist at Long Island University in Brookville, New York, and his son James, a researcher at IBM's Almaden Research Center in San Jose, California, took five volunteers up a Long Island hill with a broad view of the horizon. They stood their volunteers in front of a large semi-reflecting mirror through which they could see the horizon. In the mirror they could also see the reflected images of four fake moons from a projector.

5. When the volunteers focused through the mirror on the horizon, the four moons merged into two, creating two apparently three-dimensional moons. In one set of trials, the two moons appeared on the horizon; in the others, they were high in the sky.

6. By pressing a key, the volunteers could make one moon of the pair appear to move closer or farther away. The computer actually shifted one of the four projected images slightly sideways. This created an apparent change in distance without changing the size of the image on the retina.

7. For each trial, the volunteers adjusted the position of the movable moon until it appeared to be halfway between them and the fixed moon. It turned out that they placed a horizon moon "farther away" than an elevated moon to achieve this. On average, they took the horizon moons to be four times as distant as the elevated moons.

8. "That means that visual system is responding to the horizon moon as if it were much farther away than the elevated moon," says Kaufman, just as the older explanation of the illusion predicts.

9. So why does the real horizon Moon look closer? Aries Arditi, a vision researcher at Lighthouse International in New York City, says this stems from a logical thought process that occurs long after our unconscious mind has estimated the Moon's distance, and hence its size. Because the Moon looks bigger, it must be closer. "We can register apparent distance unconsciously in direct contradiction to our conscious experience," he says. "It's a very decisive and convincing experiment."

Complete the following summary of Reading Passage 2. Choose your answers from the list of words in the box below and write them on your answer sheet.

Scientist have for centuries argued about what caused the __(11)__ that a horizon moon looks bigger than the moon high in the sky. In the past, people referred to the mental process of human being for the answer. It's believed that the moon __(12)__ leads human brain to think that it's __(13)__ whereas the moon in the empty sky tended to suggest that it's nearer. When they were at the same size __(14)__, human brain reached the conclusion that the nearer one must be __(15)__ than the farther one.

A group of researchers proved it's true through a recent study in which __(16)__ were used as well as a mirror, projector and computers. Four volunteers looked at the __(17)__ and the four fake moons reflected in the mirror and __(18)__ the position of one of the moons. It turned out that the result of the experiment conformed to the past explanation.

List of Words

A. adjusted	E. far away	H. in the sky	K. on human retina
B. belief	F. horizon	I. indeed	L. on the horizon
C. bigger	G. illusion	J. mock moons	M. smaller
D. distance			

III. Questions 19-25 are based on Reading Passage 3. (14%)

Passage 3

For the Bees

1. A honeybee with bright red wings buzzes past a young woman's ear. The bee's colorful airfoils would seem bizarre if the woman were sniffing an apple blossom, but rather she stands at a counter strewn with pipettes, a video camera, reference books, and a beefilled yogurt container — in a chemistry laboratory at the University of Washington. There graduate student Christina M. McGraw paints bee wings in hopes of unraveling the mystery of insect flight.

2. Insects are often touted as the world's most versatile and maneuverable flying machines. Many of them can hove, loop — even turn in a distance as short as their own bodies. Yet they shouldn't be able to get off the ground, at least not according to the current reaches of solvable mathematics. The laws of quasi-steady-state aerodynamics easily explain the lift capabilities of rigid airplane wings. But insect wings flap and bend, and mapping the flow of air around moving boundaries takes an enormous leap in complexity.

3. Researchers have attacked this perplexing paradox in several ways, even by building a robotic fly. The problem is that most of these experiments and calculations treat insect wings as if they are stiff and do not describe the forces acting on them. Studying flexible bee wings, painted with a dye that responds to changes in air pressure, may provide the answers.

4. McGraw's advisers — Jamie B. Callis, Martin Gouterman and their co-workers — perfected a paint in the early 1990s that can sense air pressure on airplane wings, a technology now exploited at aircraft-testing facilities around the world. The paint relies on a chemical dye known as a platinum porphyrin, which phosphoresces a brilliant red under ultraviolet light. Oxygen in the air quickly quenches the glow, a bit the way water thrown on a fire kills the

flames. Spots on the wings that experience the highest air pressure phosphoresce the least, because more oxygen molecules are packed into denser air. By tracking the intensity of the glow, specialists can map out the forces acting on the wings.

5. Having discussed the mathematical subtleties of insect flight with Stephen Childress and Michael J. Shelley of New York University's Courant Institute, Washington physicist John S. Wettlaufer recently suggested to Callis that they use the same paint to study the flight dynamics of a hovering honeybee. The idea caught on, and bees became part of an ambitious $2.4-million collaborative project, funded by the national Science Foundation, to better understand how air and other fluids flow around moving boundaries — a phenomenon that applies to pumping heart valves as well as to flying insects.

6. It didn't take long for a problem to surface: the patented airplane paint made bees' wings too heavy and stiff to fly. The Washington group tried mixing new paint, but hordes of bees died from the solvents. Dissolving the fluorescent dye in a fluid that contains honeycomb wax turned out to be the best solution. Using a pipette McGraw now dabs each wing of an anesthetized bee with a tiny dot of paint, which spreads into a film only about two microns thick. When the bees wake up, almost all of them can fly around the room. "Going from mostly dead bees to mostly flying bees made it all seem a lot more possible, " McGraw says.

7. The team has cleared the first hurdle, but although the bees can fly, Michael H. Dickinson of the University of California at Berkeley points out that even the thin film adds weight and stiffness that may change the way the bee flaps its wings. McGraw hopes to abate Dickinson's concern with the help of Washington zoologist Thomas L. Daniel and his graduate student Stacey Combes. They will glue a painted bee to the tip of a cantilevered syringe needle and reflect a laser beam off the base to measure the lift and thrust created when the bee flaps its wings. If these force measurements match those of unpainted bees, the team will be sure it's on target. "As skeptical as I am, I sure

hope it works," Dickinson says.

8. Recent advances in computational fluid dynamics and computer power will help the team achieve its ultimate goal. Childress, Shelley and their colleagues recently simulated the forces around a two-dimensional insect wing on a computer and have shown that vortices of swirling air produced in an upstroke actually add lift during the downstroke. If the Washington experiment works, it should be able to show whether the same thing happens in real life.

9. Still, creating a pressure map of a bee wing in flight will require the detection of changing forces. That, Gouterman cautions, may be too subtle. A bee's complete wingbeat cycle takes place in mere five milliseconds, and even that rapid flapping generates only a hint of lift. But Gouterman says he also reacted with skepticism back when Callis first dreamed of developing pressure-sensitive paint to test airplanes. Now both researchers are enjoying royalties from their patents. "When Jim Callis gets ideas," Gouterman remarks, "he often gets them to work."

Match the information in 19-24 with the names of people listed in the box below and write the apporpriate letters (A-E) on your answer sheet.

People

A. Christina M. McGraw
B. James B. Callis & Martin Gouterman
C. Stephen Childress & Michael J. Shelley
D. Michael H. Dickinson
E. Thomas L. Daniel & Stacey Combes

19. _____ is/are doing research by using a material invented by researchers from other university.
20. _____ is/are working under other researchers.
21. _____ is/are worried about the accuracy of other researchers' study.
22. _____ did a study with a result that can be used to judge whether another study is successful.
23. _____ still need(s) to prove that the finding on flight dynamic of bees can apply to real ones.
24. The product of _____'s research has been widely used.

25. All the experiments mentioned in this article are designed to ____.

A. perfect a paint that can help better understand the flight dynamics of a bee
B. map the air pressure on a bee wing in flight
C. find out the differences between a bee wing and airplane wing
D. prove that the revised paint works perfectly

IV. 翻譯(20%)

1. In January, the European Union expanded eastward once again. Following the "Big Bang" enlargement of 2004, which added 75 million new EU citizens, the accession of Romania and Bulgaria has added 30 million more.

From Western Europe's Eastern Challenge By Hans-Werner Sinn

2. 如果全球人口繼續迅速成長，世界資源短缺的問題將會更形嚴重，因此各國政府不應該繼續制定提高出生率的政策。

摘錄自 Jeffrey Sachs 之 The Case for Slowing Population Growth

V. Composition (30%)

Compare and contrast yourself now with yourself five years ago. In what ways are you the same, and in what ways are you different? Write about 250 words.