LESSON 1

HOMEWORK

1. The reading passage on *Deer Farming In Australia* has 5 paragraphs (A – E). From the list of headings below choose the most suitable headings for paragraphs A – E.

NB There are more headings than paragraphs, so you will not use them all.

i Industry Structures
ii Disease Affects Production
iii Trends in Production
iv Government Assistance
v How Deer Came to Australia
vi Research and Development
vii Asian Competition
viii Industry Development

1 Paragraph A
2 Paragraph B
3 Paragraph C
4 Paragraph D
5 Paragraph E

Deer Farming In Australia

Paragraph A

Deer are not indigenous to Australia. They were introduced into the country during the nineteenth century under the acclimatization programs governing the introduction of exotic species of animals and birds into Australia. Six species of deer were released at various locations. The animals dispersed and established wild populations at various locations across Australia, mostly depending upon their points of release into the wild. These animals formed the basis for the deer industry in Australia today.

Commercial deer farming in Australia commenced in Victoria in 1971 with the authorized capture of rusa deer from the Royal National Park, NSW. Until 1985, only four species of deer, two from temperate climates (red, fallow) and two tropical species (rusa, chital) were confined for commercial farming. Late in 1985, pressure from industry to increase herd numbers saw the development of import protocols. This resulted in the introduction of large numbers of red deer hybrids from New Zealand and North American elk directly from Canada. The national farmed deer herd is now distributed throughout all states although most are in New South Wales and Victoria.

Paragraph B

The number of animals processed annually has continued to increase, despite the downward trend in venison prices since 1997. Of concern is the apparent increase in the number of female animals processed and the number of whole herds committed for processing. With more than 40,000 animals processed in 1998/99 and 60,000 in 1999/2000, there is justified concern that future years may see a dramatic drop in production. At least 85% of all venison produced in Australia is exported, principally to Europe. At least 90% of all velvet antler produced is exported in an unprocessed state to Asia.

Schemes to promote Australian deer products continue to have a positive effect on sales that in turn have a positive effect on prices paid to growers. The industry appears to be showing limited signs that it is emerging from a state of depression caused by both internal and external factors that include: (i) the Asian currency downturn; (ii) the industry’s lack of competitive advantage in influential markets (particularly in respect to New Zealand competition), and; (iii) within industry processing and marketing competition for limited product volumes of venison.

Paragraph C

From the formation of the Australian Deer Breeders Federation in 1979, the industry representative body has evolved through the Deer Farmers Federation of Australia to the Deer

Industry Association of Australia Ltd (DIAA), which was registered in 1995. The industry has established two product development and marketing companies, the Australian Deer Horn and Co-Products Pty Ltd (ADH) and the Deer Industry Projects and Development Pty Ltd, which trades as the Deer Industry Company (DIC). ADH collects and markets Australian deer horn and co-products on behalf of Australian deer farmers. It promotes the harvest of velvet antler according to the strict quality assurance program promoted by the industry. The company also plans and co-ordinates regular velvet accreditation courses for Australian deer farmers.

Paragraph D

Estimates suggest that until the early 1990s the rate of the annual increase in the number of farmed deer was up to 25%, but after 1993 this rate of increase fell to probably less than 10%. The main reasons for the decline in the deer herd growth rate at such a critical time for the market were: (i) severe drought conditions up to 1998 affecting eastern Australia during 1993-96 and (ii) the consequent slaughter of large numbers of breeding females, at very low prices. These factors combined to decrease confidence within the industry. Lack of confidence saw a drop in new investment within the industry and a lack of willingness of established farmers to expand their herds. With the development of strong overseas markets for venison and velvet and the prospect of better seasons ahead in 1996, the trends described were seen to have been significantly reversed. However, the relatively small size of the Australian herd was seen to impose undesirable restraints on the rate at which herd numbers could be expanded to meet the demands for products.

Supply difficulties were exacerbated when the supply of products, particularly venison, was maintained by the slaughter of young breeding females. The net result was depletion of the industry's female breeding herds.

Paragraph E

Industry programs are funded by statutory levies on sales of animals for venison, velvet antler sales and the sale of live animals into export markets. The industry has a 1996 - 2000 five year plan including animal nutrition, pasture quality, carcass quality, antler harvesting, promotional material and technical bulletins. All projects have generated a significant volume of information, which compliments similar work undertaken in New Zealand and other deer farming countries.

Major projects funded by levy funds include the Venison Market Project from 1992 to 1996. This initiative resulted in a dramatic increase in international demand for Australian venison and an increase in the domestic consumption of venison. In an effort to maintain existing venison markets in the short term and to increase them in the long term, in 1997 the industry's top priority became the increase in size and production capacity of the national herd.

2. The reading passage below has 7 paragraphs (A – G). From the list of headings below choose the most suitable headings for paragraphs B – G. NB There are more headings than paragraphs, so you will not use them all.

Example	*Answer*
Paragraph A	iv

i Factory Closures
ii The Human Cost
iii The Tragedy of State Mismanagement
iv A Warning to the World
v European Techniques
vi Destructive Trawling Technology
vii Lessons to be Learned
viii The Demise of the Northern Cod
ix Canadian Fishing Limits
x The Breaking of Agreements
xi Foreign Over-fishing

1 Paragraph B

2 Paragraph C
3 Paragraph D
4 Paragraph E
5 Paragraph F
6 Paragraph G

COD IN TROUBLE

A

In 1992, the devastating collapse of the cod stocks off the East coast of Newfoundland forced the Canadian government to take drastic measures and close the fishery. Over 40,000 people lost their jobs, communities are still struggling to recover and the marine ecosystem is still in a state of collapse. The disintegration of this vital fishery sounded a warning bell to governments around the world who were shocked that a relatively sophisticated, scientifically based fisheries management program, not unlike their own, could have gone so wrong. The Canadian government ignored warnings that their fleets were employing destructive fishing practices and refused to significantly reduce quotas citing the loss of jobs as too great a concern.

B

In the 1950s Canadian and US east coast waters provided an annual 100,000 tons in cod catches rising to 800,000 by 1970. This over fishing led to a catch of only 300,000 tons by 1975. Canada and the US reacted by passing legislation to extend their national jurisdictions over marine living resources out to 200 nautical miles and catches naturally declined to 139,000 tons in 1980. However the Canadian fishing industry took over and restarted the over fishing and catches rose again until, from 1985, it was the Canadians who were landing more than 250,000 tons of northern cod annually. This exploitation ravaged the stocks and by 1990 the catch was so low (29,000 tons) that in 1992 (121⁄2000 tons) Canada had to ban all fishing in east coast waters. In a fishery that had for over a century yielded a quarter-million ton catches, there remained a biomass of less than 1700 tons and the fisheries department also predicted that, even with an immediate recovery, stocks need at least 15 years before they would be healthy enough to withstand previous levels of fishing.

C

The devastating fishing came from massive investment poured into constructing huge "draggers". Draggers haul enormous nets held open by a combination of huge steel plates and heavy chains and rollers that plough the ocean bottom. They drag up anything in the way, inflicting immense damage, destroying critical habitat and contributing to the destabilization of the northern cod ecosystem. The draggers targeted huge aggregations of cod while they were spawning, a time when the fish population is highly vulnerable to capture. Excessive trawling on spawning stocks became highly disruptive to the spawning process and ecosystem. In addition, the trawling activity resulted in a physical dispersion of eggs leading to a higher fertilization failure. Physical and chemical damage to larvae caused by the trawling action also reduced their chances of survival. These draggers are now banned forever from Canadian waters.

D

Canadian media often cite excessive fishing by overseas fleets, primarily driven by the capitalist ethic, as the primary cause of the fishing out of the north Atlantic cod stocks. Many nations took fish off the coast of Newfoundland and all used deep-sea trawlers, and many often blatantly exceeded established catch quotas and treaty agreements. There can be little doubt that non North American fishing was a contributing factor in the cod stock collapse, and that the capitalist dynamics that were at work in Canada were all too similar for the foreign vessels and companies. But all of the blame cannot be put there, no matter how easy it is to do, as it does not account for the management of the resources.

E

Who was to blame? As the exploitation of the Newfoundland fishery was so predominantly guided by the government, we can argue that a fishery is not a private area, as the fisher lacks management rights normally associated with property and common property. The state had appropriated the property, and made all of the management decisions. Fishermen get told who can fish, what they can fish, and essentially, what to do with the fish once it is caught. In this regard then, when a resource such as the Newfoundland fishery collapses, it is more a tragedy of government negligence than a tragedy of the general public.

F

Following the '92 ban on northern cod fishing and most other species, an estimated 30 thousand people that had already lost their jobs after the 1992 Northern Cod moratorium took effect, were joined by an additional 12,000 fishermen and plant workers. With more than forty thousand people out of jobs, Newfoundland became an economic disaster area, as processing plants shut down, and vessels from the smallest dory to the monster draggers were made idle or sold overseas at bargain prices. Several hundred Newfoundland communities were devastated.

G

Europeans need only look across the North Atlantic to see what could be in store for their cod fishery. In Canada they were too busy with making plans, setting expansive goals, and then allocating fish, and lots of it, instead of making sound business plans to match fishing with the limited availability of the resource. Cod populations in European waters are now so depleted that scientists have recently warned that "all fisheries in this area that target cod should be closed." The Canadian calamity demonstrates that we now have the technological capability to find and annihilate every commercial fish stock, in any ocean and do irreparable damage to entire ecosystems in the process. In Canada's case, a two billion dollar recovery bill may only be a part of the total long-term costs. The costs to individuals and desperate communities now deprived of meaningful and sustainable employment is staggering.

3. The reading passage below has 6 paragraphs (A - F). Which paragraphs concentrate on the following information?

1 How antibiotic resistance happens.

2 The survival of the fittest bacteria.

3 Factors to consider in solving the antibiotic-resistant bacteria problem.

4 The impact of the discovery of the first antibiotic.

5 The misuse and overuse of antibiotics.

6 The cessation of research into combating bacterial infections.

The Rise of Antibiotic-Resistant Infections

A

When penicillin became widely available during the Second World War, it was a medical miracle, rapidly vanquishing the biggest wartime killer - infected wounds. Discovered initially by a French medical student, Ernest Duchesne, in 1896, and then rediscovered by Scottish physician Alexander Fleming in 1928, Penicillin crippled many types of disease-causing bacteria. But just four years after drug companies began mass-producing penicillin in 1943, microbes began appearing that could resist it.

B

"There was complacency in the 1980s. The perception was that we had licked the bacterial infection problem. Drug companies weren't working on new agents. They were concentrating on other areas, such as viral infections," says Michael Blum, M.D., medical officer in the Food and Drug Administration's division of anti-infective drug products. "In the meantime, resistance increased to a number of commonly used antibiotics, possibly related to overuse. In the 1990s, we've come to a point for certain infections that we don't have agents available."

C

The increased prevalence of antibiotic resistance is an outcome of evolution. Any population of organisms, bacteria included, naturally includes variants with unusual traits - in this case, the ability to withstand an antibiotic's attack on a microbe. When a person takes an antibiotic, the drug kills the defenceless bacteria, leaving behind - or "selecting," in biological terms - those that can resist it. These renegade bacteria then multiply, increasing their numbers a million fold in a day, becoming the predominant microorganism. "Whenever antibiotics are used, there is selective pressure for resistance to occur. More and more organisms develop resistance to more and more drugs," says Joe Cranston, Ph.D., director of the department of drug policy and standards at the American Medical Association in Chicago.

D

Disease-causing microbes thwart antibiotics by interfering with their mechanism of action. For example, penicillin kills bacteria by attaching to their cell walls, then destroying a key part of the wall. The wall falls apart, and the bacterium dies. Resistant microbes, however, either alter their cell walls so penicillin can't bind or produce enzymes that dismantle the antibiotic.

Antibiotic resistance results from gene action. Bacteria acquire genes conferring resistance in different ways. Bacterial DNA may mutate spontaneously. Drug-resistant tuberculosis arises this way. Another way is called transformation where one bacterium may take up DNA from another bacterium. Most frightening, however, is resistance acquired from a small circle of DNA called a plasmid, which can flit from one type of bacterium to another. A single plasmid can provide a slew of different resistances.

E

Many of us have come to take antibiotics for granted. A child develops a sore throat or an ear infection, and soon a bottle of pink medicine makes everything better. Linda McCaig, a scientist at the CDC, comments that "many consumers have an expectation that when they're ill, antibiotics are the answer. Most of the time the illness is viral, and antibiotics are not the answer. This large burden of antibiotics is certainly selecting resistant bacteria." McCaig and Peter Killeen, a fellow scientist at the CDC, tracked antibiotic use in treating common illnesses. The report cites nearly 6 million antibiotic prescriptions for sinusitis alone in 1985, and nearly 13 million in 1992. Ironically, advances in modern medicine have made more people predisposed to infection. McCaig notes that "there are a number of immuno-compromised patients who wouldn't have survived in earlier times. Radical procedures produce patients who are in difficult shape in the hospital, and there is routine use of antibiotics to prevent infection in these patients."

F

There are measures we can take to slow the inevitable resistance. Barbara Murray, M.D., of the University of Texas Medical School at Houston writes that "simple improvements in public health measures can go a long way towards preventing infection". Such approaches include more frequent hand washing by health-care workers, quick identification and isolation of patients with drug-resistant infections, and improving sewage systems and water purity.

Drug manufacturers are also once again becoming interested in developing new antibiotics. The FDA is doing all it can to speed development and availability of new antibiotic drugs. "We can't identify new agents - that's the job of the pharmaceutical industry. But once they have identified a promising new drug, what we can do is to meet with the company very early and help design the development plan and clinical trials," says Blum. In addition, drugs in development can be used for patients with multi-drug-resistant infections on an emergency compassionate use basis for people with AIDS or cancer, for example." Blum adds.

Appropriate prescribing is important. This means that physicians use a narrow spectrum antibiotics - those that target only a few bacterial types - whenever possible, so that resistances can be restricted. "There has been a shift to using costlier, broader spectrum agents. This prescribing trend heightens the resistance problem because more diverse bacteria are being exposed to antibiotics," writes Killeen. So, while awaiting the next wonder drug, we must appreciate, and use correctly, the ones that we already have.

Another problem with antibiotic use is that patients often stop taking the drug too soon, because symptoms improve. However, this merely encourages resistant microbes to proliferate. The infection returns a few weeks later, and this time a different drug must be used to treat it. The conclusion: resistance can be slowed if patients take medications correctly.

4. The Reading Passage has six paragraphs labelled A-F. Which paragraph contains the following information? Write the correct letter A-F next to Questions 1-9.

***HB** You may use any letter more than once.*

1 the reaction of the Portia spider's prey to strong web vibrations
2 a description of how the researchers set up their experiment
3 a comparison between Portia spiders and another animal species
4 an explanation of how the researchers mimicked natural conditions
5 a comparison between Portia spiders and their prey
6 the reason why concealment is important to Portia spiders
7 a description of the Portia spider's habitat
8 the number of species of Portia spiders
9 an example of the Portia spider's cleverness

Jumping spiders

A

For a stalking predator, the element of surprise is crucial. And for jumping spiders that sneak onto other
spiders' webs to prey on their owners, it can be the difference between having lunch and becoming it.

Now zoologists have discovered the secret of these spiders' tactics: creeping forward when their prey's
web is vibrating.

B

The fifteen known species of Portia jumping spiders are relatively small, with adults being about two centimetres long (that's smaller than the cap on most pens). They habitually stay in the webs of other spiders, and in an area of these webs that is as out of-the-way as possible. Portia spiders live mostly in tropical forests, where the climate is hot and humid. They hunt a range of other spiders, some of which could easily turn the tables on them. 'They will attack something about twice their own size if they are really hungry: says Stinson Wilcox of Binghamton University in New York State. Wilcox and his colleague, Kristen Gentile of the University of Canterbury in Christchurch, New Zealand, wanted to find out how Portia spiders keep the upper hand.

C

All jumping spiders have large eyes that look like binocular lenses, and they function pretty much the same way Most jumping spiders locate their prey visually, and then jump and capture from one centimetre to over ten centimetres away. Only a few species of jumping spiders invade the webs of other spiders, and the Portia spider is among them. Jumping spiders, including Portia spiders, prey on insects and other arthropods by stalking. Sometimes the spiders lure their victims by vibrating the web to mimic the struggles of a trapped insect. But many web-weaving spiders appear to be wise to these tricks, so stalking is often a better strategy. Sometimes, the researchers found, Portia spiders take advantage of the vibrations created in the web by a gentle breeze. But if necessary, they will make their own vibrations.

D

The researchers allowed various prey spiders to spin webs in the laboratory and then introduced Portia spiders. To simulate the shaking effect of a breeze the zoologists used either a model aircraft propeller or attached a tiny magnet to the centre of the web which could be vibrated by applying a varying electrical field. The researchers noticed that the stalking Portia spiders moved more when the webs were shaking than when they were still, and they were more likely to capture their prey during tests in which the webs were periodically shaken than in those where the webs were undisturbed. If the spiders were placed onto unoccupied webs, they would make no attempt to change their movements.

E

It is the Portia spider's tactic of making its victims' webs shake that has most intrigued the researchers. They noticed that the spiders would sometimes shake their quarry's web violently, then creep forwards up to five millimetres before the vibrations died down. 'They'd make a big pluck with one of their hind legs: says Wilcox. These twangs were much more powerful than the gentler vibrations Portia spiders use to mimic a trapped insect, and the researchers were initially surprised that the prey spiders did not respond to them in any way. But they have since discovered that the violent twanging produces a pattern of vibrations that match those caused by a twig falling onto the web.

F

Other predators make use of natural 'smokescreens' or disguises to hide from their prey: lions hunting at night, for example, move in on their prey when clouds obscure the moon. 'But this is the first example of an animal making its own smokescreen that we know of.' says Wilcox. 'Portia spiders are clearly intelligent and they often learn from their prey as they are trying to capture it. They do this by making different signals on the web of their prey until the prey spider makes a movement. In general, Portia spiders adjust their stalking strategy according to their prey and what the prey is doing. Thus, Portia spiders use trial-and-error learning in stalking. Sometimes they will even take an indirect route to reach a prey spider they can see from a distance. This can sometimes take one to two hours following a predetermined route. When it does this, the Portia spider is actually solving problems and thinking ahead about its actions.'