



Model Answer of Environmental studies (Z223) time: 2 h

**2016/2017 first term Full paper (Code: Z223); for
Second level students of Special Zoology**

Date of the exam: 22/1/2017

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The answer of the following questions:

1- Discuss each of the following :- (23 Marks)

a- Intended species introduction

(6 Marks)

The answer:

It is a type of species introduction in respect of human intended. So, the human being wants to introduce some species for his request and in respect to some benefits. These benefits or uses includes the followings:-

- Economical purposes: To get the flesh from some species as some species of fishes or others.
- For ecological purpose as to introduce some species to improve the habitat or to act as a predator for the existed pest.
- For medical interest as introduction of mosquitoes fish to control the spread of malaria.
- For decoration as the introduction of ornamental fish and water hyacinth.

b- Sources of air pollutants (6 Marks)

1. Stationary combustion sources: Burning of fuel for heat is the oldest form of air pollution. Since the industrial revolution, combustion of fuel (coal, petroleum oil, natural gas) has also been used extensively to generate power, for power stations, factories, etc.

Coal and petroleum oil, when they burn completely, they form carbon dioxide, sulphur oxides, nitrogen oxides, and other products. Coal, also contains incombustible minerals, and when it burns, some of the minerals ash flies out of the chimney. The smoke produced is called fly ash.

Sulphur oxides are the most significant air pollutants. Sulphur dioxide may be oxidized in the atmosphere and react with moisture to produce sulphuric acid. Such strong acid is harmful to living tissues, and it corrodes metals and buildings.

Nitrogen oxides cause browning of building and pungent smell of some urban atmospheres.

Also incomplete combustion of fuel produces carbon monoxide, a very toxic gas. Accidental deaths occur from carbon monoxide escaping into a room from a gas heater, or from charcoal cooking grills.

2. **Mobile combustion sources:** The main sources of energy for mobile engines, are gasoline, diesel fuel and jet fuel and jet fuel. The resulting air pollutants have common features with those from stationary combustion sources, but there are not fitted with air pollution control equipment as in stationary power plants. Thus, the control equipment as in stationary power plants. Thus, the mobile engines use highly refined fuel. Yet, the exhaust gases may contain particles of heavy metals as lead, zinc, etc.

In addition, many of the products of mobile combustion may react in the environment to produce additional pollution. For example, two components in automobile exhaust combine in the

presence of sunlight to produce more toxic substances known as **photochemical smog**.

Nitrogen oxides + hydrocarbons $\xrightarrow[\text{in sunlight}]{\text{ultraviolet rays}}$ PAN + ozone
(smog)

These smogs are typical of the atmospheres of sunny cities with heavy automobile traffic. PAN (peroxyacetyl nitrate) and ozone cause eye-watering, respiratory stress. In addition, they are extremely toxic to plants. **PAN affects photosynthesis**.

3.Radiation. Radiation and radioactive materials are significant pollutants of the air. The explosion and testing of nuclear weapons has added to the radioactivity in the air . In addition, the continued development of nuclear reactors for peaceful uses, means increasing volumes of radioactive wastes in the air. These radiations harmfully affects natural ecosystems.

4.Pesticides. Various pesticides have been released into the air as spray dust and granules. These chemicals are considered as serious threat to life.

c- Characters and impacts of invasive species (6 Mrks)

Characters of invasive species:

1. High reproductive fitness
2. High adaptability to wide range of habitats
3. Short life span and short duration to reach sexual maturity

Impacts of invasive species: Invasive species cause severe damage of the habitats as follows:

- Induction of severe damage of the abiotic environment
- Some invasive species cause competition with the native species and may diminish or even replaces the native one.

-some invasive species carry pathogen for many diseases and thus act for diseases spreading.

d- Effects of insecticides on non-target organisms (5 Marks)

- e- 1. Livestock have been affected by insecticides. For example when fields were sprayed aerially in an effort to the removal of some pests, many birds, sheep and others were poisoned. Bees are also killed by insecticides. These bees pollinate many plants as they move from flower to flower. As a result of bees killing, crop losses arose from lack of pollination. Sometimes, these losses are more damaging than the pest attack.
- f- 2. Fertile soil contains many soil organisms, which are vital for continued fertility of the soil. These soil organisms include bacteria, fungi, protozoa, earthworms, insects available to plants, aerate the soil, and bring about the decomposition processes. Without these organisms, the plants may die. High concentrations of pesticides may kill these soil organisms.
- g- 3. A large part of the insecticides were washed out from the land to lakes, ponds and rivers. Many rivers all over the world, now contain measurable insecticide concentration. The effects of insecticides on fishes and fish-eating birds have been particularly severe.
- h- 4. It is nearly impossible to avoid exposure to trace contaminants in food,, in air and in drinking water. We all carry measurable quantities of insecticides in our bodies. What are the chronic, long – term effects of these chemicals?

2- Write the details of each of the following:- (15 Marks)

a-Homeothermic and poikilothermic animals (5 Marks)

Homeothermic animals:

They are animals of fixed body temperature of also called endotherms as they get their temperature support from the inside. They include reptiles, aves and mammals.

Poikoltherms: they also called animals of variable body temperature their temperatures is directly related with those of the environment. They also called ectotherms as the source of their body temperature the exterior they include all the invertebrates in addition to the fishes and amphibian and reptiles.

b-Cyclomorphosis (5 Marks)

It is the phenomenon of seasonal changes of the shape of crustacean animal as damphnia. It is noted that head of the animal carry a small reduced head projection called helmet. The size of the helmet reaches it maximal size in the summer. Such phenomeno is related to the buoyancy of the water in relation to the temperature of the water.

c- Habitat and ecological niche (5 Marks)

Habitat is the place in which the organism live in it. So, the habitat is the home of the organism.

Ecological niche is the role of the organism in its habitat. It includes very fine details about the organism life . So the niche is the profession of the organism in its habitat.

3- Define each of the following: (10 Marks)

- Ozone layer depeltion (2 marks)

It is the thinning of the protective ozone layer to the pollution specially with florochloro carbon

- Medium and substratum (2 marks)

Medium is everything surrounding the animal as air and water. Substratum is the place in which the organisms based on as soil or tree bars etc.

- Native & non- native species (2 marks)

Native sp is the species firstly appeared or dfinite in specific habitat. Non- native is the species introduced or migrate to certain habitat.

- Green house effect (2 marks)

It the phenomenon in which the pollution of the air in addition to CO₂ and dusts cause the reflection back of the sun rays in the atmosphere to the earth and those reflected back from the earth

to the atmosphere is again back reflected to the earth. So, the earth temperature is increased.

- Heterotherms (2 Marks)

They are animals the their body temperature in variable when the temperature of the environment is on the range 26-34 and also is fixed when the environmental temperature is lower of higher than that range.

Best of Success

Prof Dr. Nassr-Allah H. Abdel-Hameid