



SCHOOL OF SCIENCE, ENGINEERING AND HEALTH  
DEPARTMENT OF SCIENCE AND ENGINEERING

**END OF JANUARY 2012 SEMESTER EXAMINATIONS**

**ENV 112 A - U: ENVIRONMENTAL SCIENCE**

TIME: 2 HOURS      TOTAL MARKS = 70

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**INSTRUCTIONS:**    ***ANSWER ALL THE QUESTIONS IN SECTION A AND ANSWER ANY TWO FROM SECTION B***

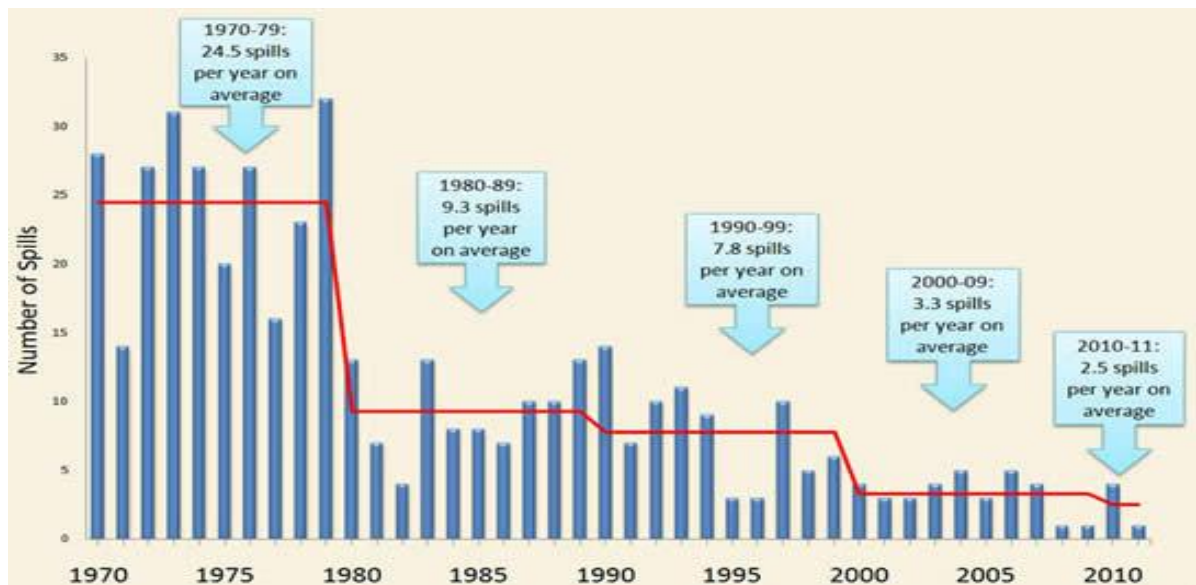
**SECTION A:** *Answer all the questions [40 marks]*

1. Agricultural activities can lead to ground water pollution. Explain. **(4 marks)**
2. Of the three environmental worldviews that you have studied, which one is closest to your worldview? Explain. **(3 marks)**
3. List any four ways of protecting endangered species. **(4 marks)**
4. Suggest two negative and two positive environmental effects that will be realized during and/or after the completion of the Thika super highway construction project in Kenya. **(4 marks)**
5. List four disadvantages of wind energy generation. **(4 marks)**
6. Define the term 'e-wastes' and state how they can be managed. **(3 marks)**
7. Sustainable Agriculture is defined as environmentally friendly methods of farming that allow the production of crops or livestock without damage to the farm.
  - (a) Explain any two farming methods that may enhance agricultural sustainability. **( 4 marks)**
  - (b) Justify the following statement; 'A farm is a terrestrial ecosystem'. **( 2 marks)**
8. Explain three ways on how enhanced green house effect may contribute to poor human health. **( 6 marks)**

9. Explain how sulphur impurities in coal can increase acidity in rain water and depletion of soil nutrients. **(4 marks)**
10. List two advantages of the multidisciplinary nature of environmental science. **( 2 marks)**

**SECTION B: *Answer any two questions [30 marks]***

11. Study the Figure below and answer the questions that follow:-



Number of large Oil spills (over 700 tonnes) from 1970 to 2011

- (a) How has the general trend of oil spills been from 1970 to 2010? Suggest three reasons for your answer. **(5 marks)**
- (b) Explain the major causes of oil spills in the oceans. **(4 marks)**
- (c) Outline the environmental effects of oil spills in the oceans. **( 4 marks)**
- (d) One remedy of an oil spill is use of micro-organisms. Explain the principle behind this procedure. **(2 marks)**
12. (a) Suggest four factors that have accelerated desertification in Kenya. **(4 marks)**
- (b) What would you recommend as the appropriate actions in curbing desertification in Africa? **(7 marks)**

- (c) Animals develop structural and behavioral adaptations to cope up in desert biomes. Give two examples of such adaptations in each category. **(4 marks)**

13. Read the following passage and answer the questions that follow:-

In Africa, burning, deforestation and increasing agricultural activities are all results of increased population density, which have negative impacts in the East-African Great Lakes region. Compared to Lake Victoria, in Lake Malawi and Tanganyika these effects are currently undetectable because the latter lakes have steep near-shore topographies. They are susceptible to soil erosion after disturbance (for example the northeast shores of Lake Tanganyika) but are not attractive for dense human population or cattle grazing. Hence the Lake Victoria catchment is much more densely populated than the other African Great Lakes. Nevertheless, cultivation and deforestation increasingly takes place in the latter lakes. A potential exists for land degradation, local increase in sediments and nutrient inputs in the very near future except for the extreme end of Tanganyika where near-shore population densities are presently low around the entire lake.

The introduction of the Nile perch in the 1950's and of the water hyacinth in Lake Victoria has also contributed greatly to the dramatic shifts in the lake's ecosystem during the past few years. Currently the presence of water hyacinth has also been reported in Lake Malawi, within the vicinity of Sugar Corporation of Malawi-Dwangwa Mill and Ethanol Company Limited and in the Shire River, the outlet of Lake Malawi. This may be of great concern to Lake Malawi. If population growth trend continues at the current rate ( $2.8\% \text{ y}^{-1}$ ) in Malawi, cultivation (e.g. sugar plantation) and deforestation on steep slopes including industrialization along the lakeshore will definitely lead into increased river runoff. This may result in more nutrient and sediment loading in the lake. Certainly the density of people occupying a catchment and the type of land-use (e.g. agriculture) they employ, will determine the effect the population can have on a lake.

- (a) List any ten environmental problems, identifiable in the above passage. **(5 marks)**  
(b) Explain how 'burning' can contribute negatively to a lake ecosystem **(3 marks)**

- (c) Lake Malawi seems to be under serious threat of eutrophication. Define the term eutrophication and from the passage above, list three factors that may be the causes of eutrophication in Lake Malawi. **(5 marks)**
- (d) Introduction of Nile Perch in Lake Victoria may have had negative effects. List two of such effects. **(2 marks)**
14. (a) Describe the features of a tropical mountain biome. **(8 marks)**
- (b) Outline any three ecological services provided by inland wetlands **(3 marks)**
- (c) (i) State the main objective of Kyoto protocol of 1997. **(1 mark)**
- (ii) List the challenges the Kyoto protocol has been facing in realization of its objective. **(3 marks)**

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