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THE UNIVERSITY of York

Degree Examination 2007

ENVIRONMENT DEPARTMENT

MSc Environmental Science & Management
MSc Marine Environmental Management

TOOLS FOR ENVIRONMENTAL ASSESSMENT

Time allowed: **two hours**

You are required to answer **THREE** long-answer questions selected from the **FIVE** possible questions listed. All questions carry equal length.

Pay adequate attention to spelling, punctuation and grammar, so that your answers can be readily understood

Question 1:

You work for a government agency with responsibility for regulating chemicals. You are required to decide whether to approve a herbicide for use on roadsides, kerbs and railway formations. The risk assessment provided by the manufacturer indicates a risk that the chemical will inhibit growth of certain aquatic plants if it enters surface water bodies.

(a) Briefly describe the information required to generate that risk assessment. For the information you have listed, what are the limitations in the data and how could you address these limitations? (40%)

(b) Options to manage the risk are being discussed by your government agency, the manufacturer, an environmental action group and end-users (Railtrack and an association of local councils). What factors would you consider in managing the risk? What do you think would be the most effective form of risk management and why? Discuss potential conflicts in perception of the risk by the four parties. (60%)

Question 2:

(a) Explain what is meant by the terms "Environmental Impact Assessment" and "Strategic Environmental Assessment". In what ways can SEA be said to address gaps that are not considered within EIA? (20%)

(b) WeDontCare Ltd is planning to develop a commercial airport on the site of the existing private airstrip at Elvington, 9 km south-east of York. The company projects that the airport will carry 1 million passengers and 40,000 tonnes of freight within 10 years of opening and that the airport will attract £100 million of inwards investment into the area around York. **N.B. Your response to parts i) and ii) could be presented in the form of a table or bulleted list.**

(i) You are an environmental consultant undertaking a scoping study for the development of the airport. Construct a matrix to identify the potential major direct and indirect impacts that would require further analysis in an environmental impact assessment. (40%)

(ii) For each impact in your answer to section (b), identify one mitigation measure and one indicator that could be used to measure change. (40%)

Question 3:

(a). Explain in one to two sentences what is meant by Life Cycle Assessment (LCA) and what are the overall goals of the technique. List the four main steps in undertaking an LCA. (20%)

(b) Describe (with one sentence each) the major life stages of a beefburger purchased from a high street burger restaurant. (20%)

(c) What are the inputs, outputs and most important issues at each life cycle stage? **[You may choose to set out your answer in the form of a table or of bulleted text].** (60%)

Question 4:

A factory can use one of two alternative technologies (A and B) to reduce the concentration of a pollutant in effluent which it discharges to a lake. Relevant details of the two technologies are shown in Table 4.1

Table 4.1

Technology	Purchase cost of equipment (£)	Annual operating cost (£)	Lifespan of equipment (years)	Pollution reduction achieved (ppm)
A	21000	500	3	35
B	12000	750	2	30

a) Using the information in Table 4.1 and an annual discount rate of 5%, carry out a discounted cash flow analysis to calculate the cost effectiveness of technology A and technology B for pollution reduction over a 6 year timespan. On the basis of this cost-effectiveness analysis, which technology will the factory fit ? (40%)

b) The lake into which the factory discharges effluent:
supports a small commercial fishery;
provides habitat for an endemic species of water snail; and
is used for recreational swimming and sailing.

Reducing the concentration of pollutant in the effluent discharged by the factory will improve water quality in the lake considerably. Describe which components of the total social value from this environmental improvement could be measured by each of the following environmental valuation techniques: (i) the travel cost method; (ii) the production function approach; and (iii) contingent valuation. (60%)

Question 5:

Elextrix Components is a company that manufactures electrical conductors for use by other companies in household electrical appliances. The company employs 50 people. Previously, the company continued to import and use PCB's illegally for several years after they were withdrawn from use in the mid-1980s. Small quantities of PCB's were stockpiled on site and subsequently leaked into a consented discharge from the site. The national environmental agency has been pursuing a legal case against Elextrix Components since 2000 and the case is about to come to court. As a result of this and other environmental misdemeanours, the company has an extremely poor reputation within the local community. The company changed hands in 2004 and the new owners have just created a new post of Environmental Manager and appointed you to the job.

(a) How would you go about quantifying and improving the environmental performance of the company? Explain your strategy, including what tools you would use to support you, how and why you would use them, how different tools would contribute to your overall plan and how you would communicate with management and the workforce. (70%)

(b) How would you improve the reputation of the company within the local community and convey the new emphasis on improved environmental performance? (30%)