2530026

THE UNIVERSITY of York

Degree Examination 2007

ENVIRONMENT DEPARTMENT

BSc Environment, Economics & Ecology
BSc Environmental Science
Part 2

HYDROLOGICAL PROCESSES

Time allowed: **two hours**

Answer **ANY TWO** questions

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

1. Why is it important to be able to model runoff from rainfall? **(15 marks)**. What are the four key stages in the development of a rainfall-runoff model? **(15 marks)**. How and why did the perceptual models of Horton (1933), Betson (1964) and Hursh (1936) differ? **(20 marks)**.

2. Explain how Thiessen polygons and isohyets may be used to quantify the spatial distribution of rainfall for rainfall-runoff models **(25 marks)**. What are the main advantages and the main disadvantages of the two techniques? **(20 marks)**.

3. Describe the evolution and underlying principles of the ASH (Aberdeen Soil Horizon) model **(30 marks)**, and explain why it failed when applied over a larger regional scale **(20 marks)**.

4. Describe two approaches that have been used to model the spatial and temporal variations in nitrate concentrations in upland moorland catchments of Great Britain.