CEL735: HYDROLOGIC PROCESSES AND MODELLING

27th NOVEMBER'06 MAJOR EXAM MAX MARKS: 60

Q.1 Discuss, in detail, the following elasses of hydrologie models:
(1) Black box models
(2) Process models
(3) Conceptual models

(10 marks)

Q.2 Discuss the proeess of model validation to evaluate models for transposability across changed land use, climate, and across geographic regions.

(6 marks)

Q.3 Explain in detail the Nash-Sutcliffe eriterion for evaluating model efficieney.

(6 marks)

Q.4 Explain in detail the following:
(1) Reasons for hysteresis in soil moisture eharaeteristie curves.
(2) Soil water diffusivity and its variation with soil wetness.

(8 marks)

Q.5 For the Green Ampt model, derive expressions for (i) time to ponding, t_p; and (ii) cumulative infiltration after ponding, F(t). Also indicatc how infiltration rates are estimated after ponding has been aehieved. Explain the answer with the help of a neat sketeh.

(8 marks)

Q.6 Describe the development and application of Philip's model for infiltration. State elearly the assumptions implied.

(10 marks)

Q.7 Distinguish between the various classical concepts of water availability to plants. In what way are the current concepts an improvement over the former?

(6 marks)

Q.8 Describe the potential approaeh to modeling the water transport across Soil-Plant-Atmosphere Continuum.

(6 marks)