

HEAT AND MASS TRANSFER OF AN MHD FORCED CONVECTION FLOW ALONG A STRETCHING SHEET WITH CHEMICAL REACTION, RADIATION AND HEAT GENERATION IN PRESENCE OF MAGNETIC FIELD

M.S. Hossain¹, M.A. Samand² and M.Mohebujjaman³

¹Department of Natural Sciences

University of Information Technology and Sciences, Dhaka-1212, Bangladesh

²Department of Mathematics, University of Dhaka, Dhaka-1000, Bangladesh

³Department of Mathematics, Bangladesh University of Engineering and Technology, Bangladesh

ABSTRACT

The present study comprises of steady two dimensional magnetohydrodynamic heat and mass transfer forced convection flow along a vertical stretching sheet in the presence of magnetic field. The problem has been analyzed by applying Nachtsheim-Swigert shooting iteration technique with sixth order Runge-Kutta integration scheme. The nonlinear partial differential equations governing the flow fields occurring in the problems have been transformed to dimensionless nonlinear ordinary differential equations by introducing suitably selected similarity variables. The ensuing equations are simultaneously solved by applying numerical iteration scheme for velocity, temperature and concentration. The results are displayed graphically in the form of velocity, temperature and concentration profiles. The corresponding skin-friction coefficient, Nusselt number and Sherwood number are displayed graphically and also in tabular form as well. The effects of several important parameters on the velocity, temperature and concentration profiles are investigated.

KEY WORDS: Radiation parameter, electric conductivity, molecular diffusivity and Schmidt number.