The Present thesis entitled "Mathematical Analysis of Capillary Blood Flow Through Non-Newtonian Fluid Model" is a record of genuine research work carried out By me, under the guidance and supervision of Dr. S.P. Singh Bhadauria (Supervisor), Reader & Head Deptt. of Mathematics Pt. J.N. (P.G.) College Banda.

The Purpose of the thesis is to study some problems on Non-Newtonian viscous and magnetic flow of blood in capillary system.

This thesis consists of six chapters

Chapter I-

In Chapter-I contains the general introduction on the subject and every account of relevant literature.

Chapter II-

In Chapter II we have discussed "Flow of Visco-Elastic-Fluid Past a Porous Sphere filled with Newtonian fluid with application to Blood flow.

In this chapter we have plotted graphs for variation of w/v with respect to porosity parameter m for constant value of \( \phi \) and variation of w/v with respect to \( \phi \) for constant value of m for solid spheres and also for gas bubble variation of w/v with respect to porosity parameter m for constant value of \( \phi \) and for gas bubble variation of w/v with respect \( \phi \) for constant value of ‘m’.
Chapter III -

In chapter III we have discussed “Behavior of Blood flow in very Narrow Capillaries”

In this chapter we have calculated the value of $U_0/V_0$ and $\eta$ and compared the calculated values from the result obtain by other authors the result are given in the form of table 3.1 and 3.2.

Chapter IV -

In Chapter IV we have discussed “Magnetic field effect on two layered model of blood flow” in this chapter a two layered magneto hydrodynamics flow through parallel plate. Under the transverse magnetic fluid has been investigated. Expression for velocity profiles in the core region and peripheral plasma layer region, flow rate and effective viscosity have been obtained, variation of flow rate and effective viscosity with PPL thickness for different values of Hartmann number is shown with the help of tables and Graphs.

Chapter V

In chapter V we have discussed “The flow of magnetic fluid past a mild stenosis with slip at the wall”.

In this Chapter the flux of magnetic field in the stenosis regions it is shown that flux is decreases due to the slip at the wall when there will be magnetic field then the flux of magnetic field depends upon $M$ and $dH/dz$. We can find appropriate values of $Q$ by maintaing magnetic field in stenosis region.
The effect of slip parameter \( \phi \) an velocity field \( q_z \), flow rate \( Q \) and apparent viscosity is shown by tables and graphs.

Chapter VI-

In Chapter VI we have discussed “Herschel–Bulkey model of viscous fluid in circulars cylinders of small radius”

In this chapter we have considered two layer flow model of blood both satisfying the Herschel-Bulkey constitutive equation of motion with no slip at the wall velocity field and apparent fluidity have been obtained. Results are discussed for different values of \( n \) and compared when peripheral plasma layer follows the Newtonian equation.

Ramesh Singh Gautam
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