**Conclusion:**

# Thus in the paper the mathematical model of multipath routing with load balancing based on quality of service parameters in the MPLS network is proposed. Solution of routing problem with help of proposed model allows providing the distribution of traffic between source and destination-node so that delays along every path are equal between each other. Proposed model corresponds to technology Traffic Engineering. Proposed model is a flow model that corresponds to the requirement for traffic in the modern telecommunication networks. Besides that proposed model works for telecommunication networks with simplex links, duplex and half-duplex links. At the same time proposed model has conditions to prevent packet looping. Using the proposed model can improve the values of the average delays by 10% compared with the solution of routing within the previously known models. Solving the routing problem within the proposed model should be used as etalon values for the improvement and configuration of existing routing protocols using load balancing technology.