Thus, from expressions (24) and (25), the values of the eigenvalues (χ) and the normalized coefficients (a)of any can be obtained in terms of the functions $Q_m(v_{mn}\mu)$ and, $P_m(v_{mn}\mu)$ which are contain some combinations of first kind of Bessel functions of order m.

Figure.2 shows, as an example, the dependence of $(Q_m, P_m) on\ (\mu)$ calculated by formulas (26) and (27), respectively.

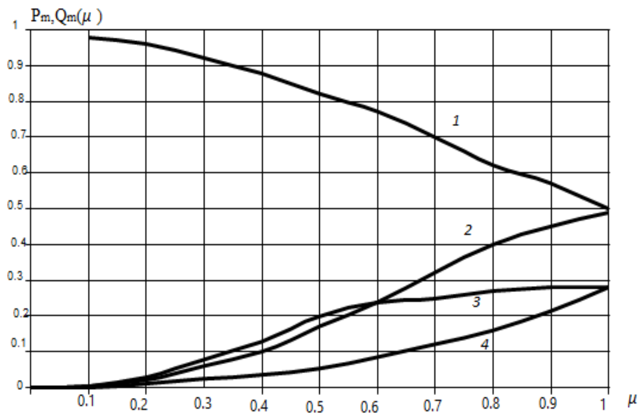

Fig. 2: The dependence of (Q_m, P_m) functions on (μ)

Where: (1)- $0.5Q_1(1.84\mu)$; (2)- $P_1(1.84\mu)$
(3)- $0.5Q_2(3.054\mu)$; (4)- $P_2(3.054\mu)$

IV. Conclusion

- The obtained expressions in this research make it possible to determine the characteristics of the quasi – H_{mn} modes in a cruciform sector waveguide, as well as quasi – H_{mn}modes in a composite sector waveguide with an arbitrary number of sectors.
- To determine the eigenvalues (χ) and normalized coefficients of the eigenfunctions, it is necessary to know the parameters $(\mu$)and (θ), which characterize the shape of the waveguide cross-section, as well as the functions $Q_m(v_{mn}\mu)$ proposed in this work.
- The characteristics of modes in a dielectric waveguide with a cross-shaped sectorial cross-section can be determined similarly to a metal waveguide, based on the Ritz method.

This paper is very useful for signal processing and communications academic community.

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