5[7.30].–SALVADOR CONDE & SHYAM L. KALLA, *Tables of Bessel Functions and Roots of Related Transcendental Equations*, Graduate School, Faculty of Engineering, University of Zulia, Maracaibo, Zulia, Venezuela, 1978, iv + 284 pp., 8½″ × 11″, deposited in the UMT file.

In times past extensive tables of the Bessel functions $J_\nu(x)$, $Y_\nu(x)$, $I_\nu(x)$ and $K_\nu(x)$ were constructed, mostly for ν a positive integer or zero, $\nu = \pm 1/2$, and x variable $0 < x < \infty$. We also have tables of the Airy functions which are essentially Bessel functions of order $\pm 1/3$ and $\pm 2/3$. Tables for other values of ν are virtually nonexistent. On the other hand Luke [1] has given 205 coefficients which are accurate to 20 decimals to enable evaluation of $(2z/\pi)^{1/2}e^z K_\nu(z)$ for all $z \geqslant 5$ and all ν, $0 \leqslant \nu \leqslant 1$ by means of a double series expansion in Chebyshev polynomials. Similar and more extensive coefficients for $I_\nu(x)$, $J_\nu(x)$ and $Y_\nu(x)$ are also given by Luke [2, 3]. However, in the classical sense of table making, systematic tables in both ν and x directions are wanting. One purpose of the report at hand is to fill this gap. Based on these evaluations, some tables of zeros of certain combinations of the functions are also given. These are described later.

The volume begins with a description of the functions noted above. There is a section on applications presenting a variety of problems in engineering and physics where Bessel functions arise and where values of zeros of the functions and combinations thereof are required, especially ν-wise. The bulk of the report consists of seven tables. Where pertinent, the ν range is 0(0.1)1 and except for Table 1, each table is to 12 significant figures. The evaluations are based on appropriate use of the usual power series and asymptotic series expansions. The tables are as follows:

Table 1. $J_\nu(x)$, $Y_\nu(x)$, $I_\nu(x)$, $K_\nu(x)$, $x = 0(0.01)1.0(0.1)6.0(0.25)20$. J_ν and Y_ν are to 11 significant figures, I_ν and K_ν are to 9 significant figures.

Table 2. First 260 positive zeros of $J_\nu(x)$.

Table 3. First 260 positive zeros of $Y_\nu(x)$.

Table 4. First 28 positive roots of $hJ_0(x) - J_1(x) = 0$, $h = 0.01(0.01)2.0(0.05)5.0(0.5)30.0(2)100(10)500(50)2000$.

Table 5. First 28 positive roots of $J_\nu(x)Y_\nu(\beta x) - J_\nu(\beta x)Y_\nu(x) = 0$, $\beta = 0.1(0.1)2.0$.

Table 6. First 28 positive roots of $J_\nu(x)Y_{\nu-1}(\beta x) - J_{\nu-1}(\beta x)Y_\nu(x) = 0$, $\beta = 0.1(0.1)2.0$.

Table 7. First 28 positive roots of $J_{\nu-1}(x)Y_\nu(\beta x) - J_\nu(\beta x)Y_{\nu-1}(x) = 0$, $\beta = 0.1(0.1)2.0$.

Y. L.

1. Y. L. LUKE, "Miniaturized tables of Bessel functions," *Math. Comp.*, v. 25, 1971, pp. 323–330.

2, 3. Y. L. LUKE, "Miniaturized tables of Bessel functions," *Math. Comp.*, v. 25, 1971, pp. 789–795; v. 26, 1972, pp. 237–240.