

**TABLE 7**

Percentage points of the chi-square distribution

| $df/\alpha =$ | .999    | .995    | .99     | .975    | .95     | .90    |
|---------------|---------|---------|---------|---------|---------|--------|
| 1             | .000002 | .000039 | .000157 | .000982 | .003932 | .01579 |
| 2             | .002001 | .01003  | .02010  | .05064  | .1026   | .2107  |
| 3             | .02430  | .07172  | .1148   | .2158   | .3518   | .5844  |
| 4             | .09080  | .2070   | .2971   | .4844   | .7107   | 1.064  |
| 5             | .2102   | .4117   | .5543   | .8312   | 1.145   | 1.610  |
| 6             | .3811   | .6757   | .8721   | 1.237   | 1.635   | 2.204  |
| 7             | .5985   | .9893   | 1.239   | 1.690   | 2.167   | 2.833  |
| 8             | .8571   | 1.344   | 1.646   | 2.180   | 2.733   | 3.490  |
| 9             | 1.152   | 1.735   | 2.088   | 2.700   | 3.325   | 4.168  |
| 10            | 1.479   | 2.156   | 2.558   | 3.247   | 3.940   | 4.865  |
| 11            | 1.834   | 2.603   | 3.053   | 3.816   | 4.575   | 5.578  |
| 12            | 2.214   | 3.074   | 3.571   | 4.404   | 5.226   | 6.304  |
| 13            | 2.617   | 3.565   | 4.107   | 5.009   | 5.892   | 7.042  |
| 14            | 3.041   | 4.075   | 4.660   | 5.629   | 6.571   | 7.790  |
| 15            | 3.483   | 4.601   | 5.229   | 6.262   | 7.261   | 8.547  |
| 16            | 3.942   | 5.142   | 5.812   | 6.908   | 7.962   | 9.312  |
| 17            | 4.416   | 5.697   | 6.408   | 7.564   | 8.672   | 10.09  |
| 18            | 4.905   | 6.265   | 7.015   | 8.231   | 9.390   | 10.86  |
| 19            | 5.407   | 6.844   | 7.633   | 8.907   | 10.12   | 11.65  |
| 20            | 5.921   | 7.434   | 8.260   | 9.591   | 10.85   | 12.44  |
| 21            | 6.447   | 8.034   | 8.897   | 10.28   | 11.59   | 13.24  |
| 22            | 6.983   | 8.643   | 9.542   | 10.98   | 12.34   | 14.04  |
| 23            | 7.529   | 9.260   | 10.20   | 11.69   | 13.09   | 14.85  |
| 24            | 8.085   | 9.886   | 10.86   | 12.40   | 13.85   | 15.66  |
| 25            | 8.649   | 10.52   | 11.52   | 13.12   | 14.61   | 16.47  |
| 26            | 9.222   | 11.16   | 12.20   | 13.84   | 15.38   | 17.29  |
| 27            | 9.803   | 11.81   | 12.88   | 14.57   | 16.15   | 18.11  |
| 28            | 10.39   | 12.46   | 13.56   | 15.31   | 16.93   | 18.94  |
| 29            | 10.99   | 13.12   | 14.26   | 16.06   | 17.71   | 19.77  |
| 30            | 11.59   | 13.79   | 14.95   | 16.79   | 18.49   | 20.60  |
| 40            | 17.92   | 20.71   | 22.16   | 24.43   | 26.51   | 29.05  |
| 50            | 24.67   | 27.99   | 29.71   | 32.36   | 34.76   | 37.69  |
| 60            | 31.74   | 35.53   | 37.48   | 40.48   | 43.19   | 46.46  |
| 70            | 39.04   | 43.28   | 45.44   | 48.76   | 51.74   | 55.33  |
| 80            | 46.52   | 51.17   | 53.54   | 57.15   | 60.39   | 64.28  |
| 90            | 54.16   | 59.20   | 61.75   | 65.65   | 69.13   | 73.29  |
| 100           | 61.92   | 67.33   | 70.06   | 74.22   | 77.93   | 82.36  |
| 120           | 77.76   | 83.85   | 86.92   | 91.57   | 95.70   | 100.62 |
| 240           | 177.95  | 187.32  | 191.99  | 198.98  | 205.14  | 212.39 |

**TABLE 7**  
(continued)

| $\alpha = .10$ | .05    | .025   | .01    | .005   | .001   | df  |
|----------------|--------|--------|--------|--------|--------|-----|
| 2.706          | 3.841  | 5.024  | 6.635  | 7.879  | 10.83  | 1   |
| 4.605          | 5.991  | 7.378  | 9.210  | 10.60  | 13.82  | 2   |
| 6.251          | 7.815  | 9.348  | 11.34  | 12.84  | 16.27  | 3   |
| 7.779          | 9.488  | 11.14  | 13.28  | 14.86  | 18.47  | 4   |
| 9.236          | 11.07  | 12.83  | 15.09  | 16.75  | 20.52  | 5   |
| 10.64          | 12.59  | 14.45  | 16.81  | 18.55  | 22.46  | 6   |
| 12.02          | 14.07  | 16.01  | 18.48  | 20.28  | 24.32  | 7   |
| 13.36          | 15.51  | 17.53  | 20.09  | 21.95  | 26.12  | 8   |
| 14.68          | 16.92  | 19.02  | 21.67  | 23.59  | 27.88  | 9   |
| 15.99          | 18.31  | 20.48  | 23.21  | 25.19  | 29.59  | 10  |
| 17.28          | 19.68  | 21.92  | 24.72  | 26.76  | 31.27  | 11  |
| 18.55          | 21.03  | 23.34  | 26.22  | 28.30  | 32.91  | 12  |
| 19.81          | 22.36  | 24.74  | 27.69  | 29.82  | 34.53  | 13  |
| 21.06          | 23.68  | 26.12  | 29.14  | 31.32  | 36.12  | 14  |
| 22.31          | 25.00  | 27.49  | 30.58  | 32.80  | 37.70  | 15  |
| 23.54          | 26.30  | 28.85  | 32.00  | 34.27  | 39.25  | 16  |
| 24.77          | 27.59  | 30.19  | 33.41  | 35.72  | 40.79  | 17  |
| 25.99          | 28.87  | 31.53  | 34.81  | 37.16  | 42.31  | 18  |
| 27.20          | 30.14  | 32.85  | 36.19  | 38.58  | 43.82  | 19  |
| 28.41          | 31.41  | 34.17  | 37.57  | 40.00  | 45.31  | 20  |
| 29.62          | 32.67  | 35.48  | 38.93  | 41.40  | 46.80  | 21  |
| 30.81          | 33.92  | 36.78  | 40.29  | 42.80  | 48.27  | 22  |
| 32.01          | 35.17  | 38.08  | 41.64  | 44.18  | 49.73  | 23  |
| 33.20          | 36.42  | 39.36  | 42.98  | 45.56  | 51.18  | 24  |
| 34.38          | 37.65  | 40.65  | 44.31  | 46.93  | 52.62  | 25  |
| 35.56          | 38.89  | 41.92  | 45.64  | 48.29  | 54.05  | 26  |
| 36.74          | 40.11  | 43.19  | 46.96  | 49.65  | 55.48  | 27  |
| 37.92          | 41.34  | 44.46  | 48.28  | 50.99  | 56.89  | 28  |
| 39.09          | 42.56  | 45.72  | 49.59  | 52.34  | 58.30  | 29  |
| 40.26          | 43.77  | 46.98  | 50.89  | 53.67  | 59.70  | 30  |
| 51.81          | 55.76  | 59.34  | 63.69  | 66.77  | 73.40  | 40  |
| 63.17          | 67.50  | 71.42  | 76.15  | 79.49  | 86.66  | 50  |
| 74.40          | 79.08  | 83.30  | 88.38  | 91.95  | 99.61  | 60  |
| 85.53          | 90.53  | 95.02  | 100.43 | 104.21 | 112.32 | 70  |
| 96.58          | 101.88 | 106.63 | 112.33 | 116.32 | 124.84 | 80  |
| 107.57         | 113.15 | 118.14 | 124.12 | 128.30 | 137.21 | 90  |
| 118.50         | 124.34 | 129.56 | 135.81 | 140.17 | 149.45 | 100 |
| 140.23         | 146.57 | 152.21 | 158.95 | 163.65 | 173.62 | 120 |
| 268.47         | 277.14 | 284.80 | 293.89 | 300.18 | 313.44 | 240 |

Source: Computed by P. J. Hildebrand.