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===== LOADING DATASET =====
      transaction_id customer_id transaction_amount transaction_date transaction_count region transaction_status
0  e98aa092-3770-4fdb-9502-5b5a6a244811  CUST2824          3821.34      2023-01-26           3 North          Fail
1  11ba6918-dba0-41e5-96cf-f5a7b95f0103  CUST1409          2781.84      2023-01-28           0 East          Fail
2  82b7654b-6eb7-4579-89a0-1a9edec0a7bb  CUST5506          4120.97      2023-01-28           0 South         Fail
3  f7166574-f400-4d53-b526-0b11f6619ddf  CUST5012          6383.78      2023-01-18           2 South         Success
4  8632fe26-b507-4068-9c68-1b2fa04fecb3  CUST4657          2651.61      2023-01-04           4 North         Success

Columns: Index(['transaction_id', 'customer_id', 'transaction_amount',
               'transaction_date', 'transaction_count', 'region',
               'transaction_status'],
              dtype='object')

===== DATA CLEANING =====
      transaction_amount      transaction_date transaction_count      success
count      220.000000          220          220.000000      220.000000
mean      3365.192409  2023-01-15 17:14:10.909090816          2.854545      0.445455
min        804.420000      2023-01-01 00:00:00          0.000000      0.000000
25%       2124.205000      2023-01-07 00:00:00          1.750000      0.000000
50%       3077.715000      2023-01-16 00:00:00          3.000000      0.000000
75%       3950.737500      2023-01-23 06:00:00          4.000000      1.000000
max       20462.840000      2023-01-31 00:00:00          9.000000      1.000000
std        1985.705409              NaN          1.797189      0.498149

===== BERNOULLI DISTRIBUTION =====
Probability of Successful Transaction: 0.4455

===== BINOMIAL DISTRIBUTION =====
Binomial Probability: 0.11520447243641226

===== POISSON DISTRIBUTION =====
Average daily orders: 7.096774193548387
Poisson Probability: 0.1489040468217995

===== LOG-NORMAL DISTRIBUTION =====
Shape: 0.5416831487801056 Loc: 333.7722748609052 Scale: 2604.740667049811

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===== POWER LAW DISTRIBUTION =====
Power Law Parameters: (np.float64(0.41232325172331613), np.float64(804.4199999999998), np.float64(19658.420000000006))

===== Q-Q PLOT =====

===== BOX-COX TRANSFORMATION =====
Lambda value: -0.18123612911845818

===== Z-SCORE PROBABILITY =====
Mean: 3365.1924090909088
Std: 1985.705409161596
Z-score: 0.8232880785671723
Probability transaction > 5000: 0.20517209567554384

===== PDF & CDF =====

===== FINAL CONCLUSION =====
Transaction amounts follow a LOG-NORMAL distribution (right-skewed).
Few customers spend large amounts while majority spend small amounts.
This is typical E-commerce customer behavior.

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