Saving dataset80\_20\_top30.csv to dataset80\_20\_top30.csv

=== Class Ratio Before SMOTIFIED-GAN ===

Proportion

Legitimate 0.8

Phishing 0.2

**952/952** ━━━━━━━━━━━━━━━━━━━━ **2s** 2ms/step

=== Class Ratio After SMOTIFIED-GAN ===

Proportion

Legitimate 0.5

Phishing 0.5

=== Model Ranking on Train Set ===

Ranking by Accuracy:

Model

Random Forest 0.926801

Stacking Ensemble 0.923892

CatBoost 0.921044

XGBoost 0.919920

Logistic Regression 0.904372

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

Random Forest 0.890021

Stacking Ensemble 0.887046

CatBoost 0.883035

XGBoost 0.881810

Logistic Regression 0.844688

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.990948

Random Forest 0.973953

Stacking Ensemble 0.971490

CatBoost 0.970659

XGBoost 0.969828

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

Random Forest 0.930097

Stacking Ensemble 0.927350

CatBoost 0.924776

XGBoost 0.923727

Logistic Regression 0.911991

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

Random Forest 0.926801

Stacking Ensemble 0.923892

CatBoost 0.921044

XGBoost 0.919920

Logistic Regression 0.904372

Name: ROC-AUC, dtype: float64

=== Model Ranking on Test Set ===

Ranking by Accuracy:

Model

Stacking Ensemble 0.863172

Random Forest 0.862253

CatBoost 0.862161

XGBoost 0.861701

Logistic Regression 0.843080

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

Stacking Ensemble 0.613180

Random Forest 0.611864

CatBoost 0.610421

XGBoost 0.608929

Logistic Regression 0.563319

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.958161

XGBoost 0.862299

CatBoost 0.859080

Stacking Ensemble 0.855632

Random Forest 0.851264

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

Stacking Ensemble 0.714395

XGBoost 0.713796

CatBoost 0.713713

Random Forest 0.711978

Logistic Regression 0.709507

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

Logistic Regression 0.886236

XGBoost 0.861925

CatBoost 0.861006

Stacking Ensemble 0.860345

Random Forest 0.858132

Name: ROC-AUC, dtype: float64

=== Cross-Validation Scores ===

Accuracy F1 Score ROC-AUC

Logistic Regression 0.904557 0.912139 0.950384

Random Forest 0.915899 0.919730 0.979820

XGBoost 0.915714 0.919792 0.980697

CatBoost 0.915493 0.919436 0.980840

Stacking Ensemble 0.916835 0.920528 0.978111