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

Proportion

Legitimate 0.949999

Phishing 0.050001

**1202/1202** ━━━━━━━━━━━━━━━━━━━━ **3s** 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 0.986250

Stacking Ensemble 0.985049

XGBoost 0.983663

CatBoost 0.982385

Logistic Regression 0.905920

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

Random Forest 0.994581

Stacking Ensemble 0.992619

XGBoost 0.992289

CatBoost 0.991220

Logistic Regression 0.854027

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.979214

Random Forest 0.977828

Stacking Ensemble 0.977366

XGBoost 0.974902

CatBoost 0.973393

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

Random Forest 0.986133

Stacking Ensemble 0.984933

XGBoost 0.983519

CatBoost 0.982226

Logistic Regression 0.912346

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

Random Forest 0.986250

Stacking Ensemble 0.985049

XGBoost 0.983663

CatBoost 0.982385

Logistic Regression 0.905919

Name: ROC-AUC, dtype: float64

=== Model Ranking on Test Set ===

Ranking by Accuracy:

Model

CatBoost 0.965487

XGBoost 0.964832

Stacking Ensemble 0.963958

Random Forest 0.963903

Logistic Regression 0.816896

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

CatBoost 0.731270

XGBoost 0.723684

Random Forest 0.707317

Stacking Ensemble 0.699377

Logistic Regression 0.159351

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.622271

Stacking Ensemble 0.490175

CatBoost 0.490175

XGBoost 0.480349

Random Forest 0.474891

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

CatBoost 0.586928

XGBoost 0.577428

Stacking Ensemble 0.576380

Random Forest 0.568256

Logistic Regression 0.253728

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

CatBoost 0.740345

Stacking Ensemble 0.739540

XGBoost 0.735346

Random Forest 0.732272

Logistic Regression 0.724707

Name: ROC-AUC, dtype: float64

=== Cross-Validation Scores ===

Accuracy F1 Score ROC-AUC

Logistic Regression 0.904868 0.911504 0.990025

Random Forest 0.981289 0.981135 0.996826

XGBoost 0.980636 0.980455 0.997488

CatBoost 0.981437 0.981272 0.997671

Stacking Ensemble 0.981449 0.981326 0.997519