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

Proportion

Legitimate 0.9

Phishing 0.1

**1128/1128** ━━━━━━━━━━━━━━━━━━━━ **5s** 4ms/step

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

Proportion

Phishing 0.5

Legitimate 0.5

=== Model Ranking on Train Set ===

Ranking by Accuracy:

Model

Random Forest 0.932892

Stacking Ensemble 0.930844

XGBoost 0.930675

CatBoost 0.930614

Logistic Regression 0.904149

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

Random Forest 0.899633

Stacking Ensemble 0.899435

CatBoost 0.897394

XGBoost 0.896865

Logistic Regression 0.845294

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.989377

Random Forest 0.974506

XGBoost 0.973274

CatBoost 0.972412

Stacking Ensemble 0.970164

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

Random Forest 0.935574

XGBoost 0.933509

Stacking Ensemble 0.933462

CatBoost 0.933398

Logistic Regression 0.911678

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

Random Forest 0.932891

Stacking Ensemble 0.930844

XGBoost 0.930674

CatBoost 0.930613

Logistic Regression 0.904148

Name: ROC-AUC, dtype: float64

=== Model Ranking on Test Set ===

Ranking by Accuracy:

Model

CatBoost 0.864577

XGBoost 0.864422

Stacking Ensemble 0.864060

Random Forest 0.863335

Logistic Regression 0.822626

Name: Accuracy, dtype: float64

Ranking by Precision:

Model

XGBoost 0.400979

CatBoost 0.400349

Random Forest 0.397276

Stacking Ensemble 0.396670

Logistic Regression 0.350639

Name: Precision, dtype: float64

Ranking by Recall:

Model

Logistic Regression 0.908432

XGBoost 0.720641

CatBoost 0.711847

Random Forest 0.709260

Stacking Ensemble 0.690119

Name: Recall, dtype: float64

Ranking by F1 Score:

Model

XGBoost 0.515258

CatBoost 0.512477

Random Forest 0.509287

Logistic Regression 0.505979

Stacking Ensemble 0.503776

Name: F1 Score, dtype: float64

Ranking by ROC-AUC:

Model

Logistic Regression 0.860763

XGBoost 0.800518

CatBoost 0.796696

Random Forest 0.794857

Stacking Ensemble 0.786752

Name: ROC-AUC, dtype: float64

=== Cross-Validation Scores ===

Accuracy F1 Score ROC-AUC

Logistic Regression 0.904155 0.911636 0.977840

Random Forest 0.927248 0.930096 0.949371

XGBoost 0.927458 0.930348 0.951086

CatBoost 0.927864 0.930775 0.951169

Stacking Ensemble 0.927347 0.930005 0.983842