חלק ב

Decision Tree :

1.

```
criterion='gini',
max_depth=10,
min_samples_split=5,
min_samples_leaf=2,
max_features='sqrt',
ccp_alpha=0.01,
random_state=42
```

```
Decision Tree Evaluation:
Accuracy: 0.9298
Precision: 0.9315
Recall: 0.9577
F1 Score: 0.9444
Confusion Matrix:
[[38  5]
 [ 3 68]]
```

2.

```
criterion='gini',
max_depth=10,
min_samples_split=5,
min_samples_leaf=2,
max_features='sqrt',
ccp_alpha=0.01,
random_state=0
```

```
Decision Tree Evaluation:
Accuracy: 0.9474
Precision: 0.9710
Recall: 0.9437
F1 Score: 0.9571
Confusion Matrix:
[[41  2]
 [ 4 67]]
```

3.

```
criterion='entropy'
max_depth=10,
min_samples_split=5
min_samples_leaf=2,
max_features='sqrt'
ccp_alpha=0.01,
random_state=0
```

```
Decision Tree Evaluation:
Accuracy: 0.9474
Precision: 0.9577
Recall: 0.9577
F1 Score: 0.9577
Confusion Matrix:
[[40  3]
 [ 3 68]]
```

4.

```
criterion='entropy',
max_depth=10,
min_samples_split=5,
min_samples_leaf=2,
max_features='sqrt',
ccp_alpha=0.01,
random_state=42
```

```
Decision Tree Evaluation
Accuracy: 0.9649
Precision: 0.9718
Recall: 0.9718
F1 Score: 0.9718
Confusion Matrix:
[[41  2]
 [ 2 69]]
```

5.

```
criterion='entropy',
max_depth=10,
min_samples_split=10,
min_samples_leaf=8,
max_features='sqrt',
ccp_alpha=0.01,
random_state=42
```

```
Decision Tree Evaluation:
Accuracy: 0.9825
Precision: 0.9859
Recall: 0.9859
F1 Score: 0.9859
Confusion Matrix:
[[42  1]
 [ 1 70]]
```

Random Forest:

1.

```
n_estimators=200,
criterion='entropy'
max_depth=30,
min_samples_split=4
min_samples_leaf=1,
max_features='sqrt'
bootstrap=False,
random_state=0
```

```
Random Forest Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

2.

```
n_estimators=200,
criterion='entropy
max_depth=10,
min_samples_split=
min_samples_leaf=1
max_features='sqrt
bootstrap=False,
random_state=0
```

```
Random Forest Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

3.

```
n_estimators=200,
criterion='entropy'
max_depth=10,
min_samples_split=4
min_samples_leaf=1,
max_features='sqrt'
bootstrap=True,
random_state=0
```

```
Random Forest Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

4.

```
n_estimators=200,
criterion='entropy'
max_depth=10,
min_samples_split=4
min_samples_leaf=1,
max_features='sqrt'
bootstrap=True,
random_state=42
```

```
Random Forest Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

5.

```
n_estimators=400,
criterion='gini',
max_depth=10,
min_samples_split=4
min_samples_leaf=1,
max_features='sqrt'
bootstrap=True,
random_state=42
```

```
Random Forest Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

AdaBoost:

1.

```
n_estimators=200,
learning_rate=0.01,
algorithm='SAMME.R',
random_state=10
```

```
AdaBoost Evaluation:
Accuracy: 0.9561
Precision: 0.9583
Recall: 0.9718
F1 Score: 0.9650
Confusion Matrix:
[[40  3]
 [ 2 69]]
```

2.

```
n_estimators=150,
learning_rate=0.01,
algorithm='SAMME.R',
random_state=10
```

```
AdaBoost Evaluation:
Accuracy: 0.9561
Precision: 0.9583
Recall: 0.9718
F1 Score: 0.9650
Confusion Matrix:
[[40  3]
 [ 2 69]]
```

3.

```
n_estimators=150,
learning_rate=0.1,
algorithm='SAMME.R',
random_state=10
```

```
AdaBoost Evaluation:
Accuracy: 0.9649
Precision: 0.9589
Recall: 0.9859
F1 Score: 0.9722
Confusion Matrix:
[[40  3]
 [ 1 70]]
```

4.

```
n_estimators=150,
learning_rate=0.5,
algorithm='SAMME.R'
random_state=10
```

```
AdaBoost Evaluation:
Accuracy: 0.9737
Precision: 0.9722
Recall: 0.9859
F1 Score: 0.9790
Confusion Matrix:
[[41  2]
 [ 1 70]]
```

5.

```
n_estimators=150,
learning_rate=0.7,
algorithm='SAMME.R'
random_state=10
```

```
AdaBoost Evaluation:
Accuracy: 0.9825
Precision: 0.9726
Recall: 1.0000
F1 Score: 0.9861
Confusion Matrix:
[[41  2]
 [ 0 71]]
```