Code & OUTPUT

In [2]:
```
print("Experiment No 05 : To implement data classification using KNN.")
```

```
Experiment No 05 : To implement data classification using KNN.
```

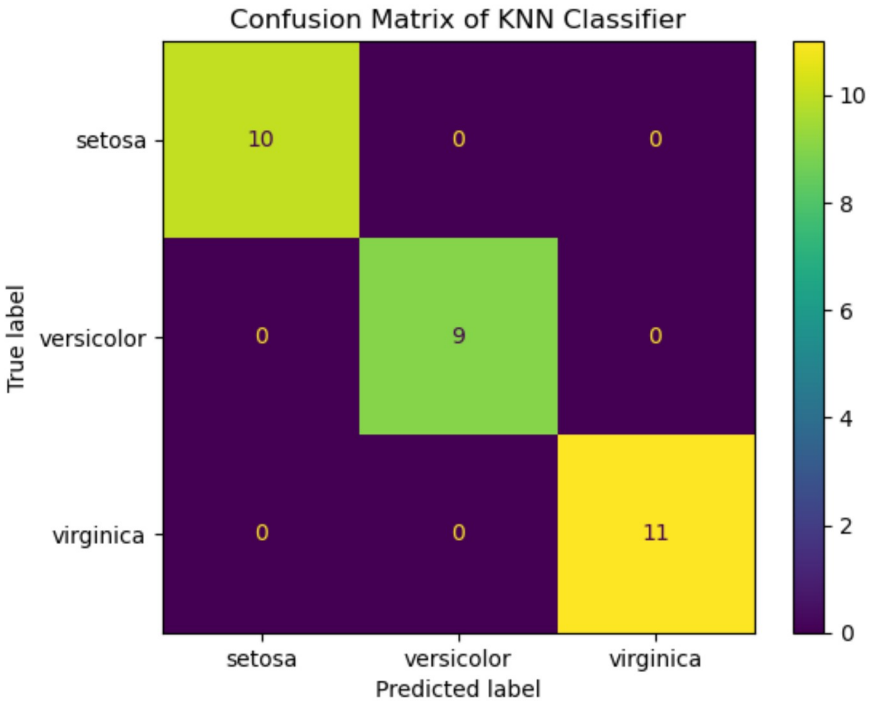
In [4]:
```
# Import necessary libraries
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix, ConfusionMatrixDisplay
import matplotlib.pyplot as plt

print("OUTPUT:\n\n")

# Load the Iris dataset
iris = load_iris()
X = iris.data  # Features (sepal length, sepal width, petal length, petal width)
y = iris.target  # Target (species)

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Initialize the K-Nearest Neighbors classifier with k=3
knn = KNeighborsClassifier(n_neighbors=3)

# Train the model
knn.fit(X_train, y_train)

# Make predictions on the test set
y_pred = knn.predict(X_test)

# Calculate accuracy
accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy: {accuracy:.2f}")

# Display a detailed classification report
print("\nClassification Report:")
print(classification_report(y_test, y_pred, target_names=iris.target_names))

# Plotting the Confusion Matrix
ConfusionMatrixDisplay.from_predictions(y_test, y_pred, display_labels=iris.target_names)
plt.title("Confusion Matrix of KNN Classifier")
plt.show()
```

OUTPUT:

Accuracy: 1.00

Classification Report:

	precision	recall	f1-score	support
setosa	1.00	1.00	1.00	10
versicolor	1.00	1.00	1.00	9
virginica	1.00	1.00	1.00	11
accuracy			1.00	30
macro avg	1.00	1.00	1.00	30
weighted avg	1.00	1.00	1.00	30


Confusion Matrix of KNN Classifier
setosa
versicolor
virginica
True label
10
0
0
0
9
0
0
0
11
setosa
versicolor
virginica
Predicted label
10
8
6
4
2
0

In [ ]: