EXPERIMENT – 4

PROGRAM:

```
import numpy as np

np.random.seed(1)

print("Enter number of input nodes:")
n_input = int(input())

print("Enter number of hidden nodes:")
n_hidden = int(input())

print("Enter number of output nodes:")
n_output = int(input())

print("Enter input data (4 samples, each with", n_input, "features):")
X = []
for _ in range(4):
    row = list(map(float, input().split()))
    X.append(row)

print("Enter target outputs (4 samples, each with", n_output, "values):")
y = []
for _ in range(4):
    row = list(map(float, input().split()))
    y.append(row)

X = np.array(X)
y = np.array(y)
```

```
W1 = np.random.randn(n_input, n_hidden)
W2 = np.random.randn(n_hidden, n_output)

def sigmoid(x):
    return 1 / (1 + np.exp(-x))

for _ in range(10000):
    hidden = sigmoid(np.dot(X, W1))
    output = sigmoid(np.dot(hidden, W2))

    error = y - output
    d_output = error * output * (1 - output)
    d_hidden = d_output.dot(W2.T) * hidden * (1 - hidden)

    W2 += hidden.T.dot(d_output)
    W1 += X.T.dot(d_hidden)

print("Final output:")
print(output)
```