Laboratorium 1: Spectral Analysis of Deterministic Signals

Adam Kubliński, gr 1a

In [ ]:
```python
import numpy as np
import matplotlib.pyplot as plt

#Variant 12
N = 10
x_mu = np.array([7, 2, 4, 3, 4, 5, 0, 0, 0, 0])


n = np.arange(N)
x_n = np.zeros(N, dtype=complex)

for k in range(N):
    x_n += (1/N) * x_mu[k] * np.exp(2j * np.pi * k * n / N)

x_n = np.real(x_n)

print(x_n)

plt.figure(figsize=(10, 4))
markerline, stemlines, baseline = plt.stem(n, x_n)
plt.setp(markerline, 'markerfacecolor', 'b')
plt.setp(stemlines, 'color', 'b')
plt.setp(baseline, 'color', 'r', 'linewidth', 2)
plt.title("Discrete time signal x(n)")
plt.xlabel("n")
plt.ylabel("x(n)")
plt.grid(True)
plt.show()
```

```
[2.5       0.0690983 0.8190983 0.1809017 0.9309017 0.5       0.9309017
 0.1809017 0.8190983 0.0690983]
```