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# Daffodil International University

**Faculty of Science & Information Technology**
**Department of Computer Science & Engineering**
**Midterm Examination, Summer 2026**
**Course Code: CSE226, Course Title: Numerical Methods**
**Level: 2 Term: 3, Batch: 67**

**Time: 1:30 hrs.** **Marks: 25**

## Answer ALL Questions

*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially]*

**1.** (a) Identify the number of significant digits of $1.0\times10^{-6}$, 0.000550, 010.002 and 20.0000 along with the necessary conditions of being significant digits. — **2**

(b) Solve $S=\sqrt{11}+\sqrt{7}+\sqrt{5}+\sqrt{3}$ to 6 significant digits along with the $E_A$, $E_R$, and $E_P$. — **3** — **CO1**

**2.** (a) Apply false position method to find a real root of $e^x-4x^2=0$ that lies on (0,1) correct to 4 decimal places. — **5**

(b) Apply fixed point iteration method to find a real root of $\cos x-3x+3=0$ belonging in (1,2) correct to 5 significant digits. — **5** — **CO2**

**3.** (a) The population of a town in the last six censuses was recorded as follows: — **5**

| Year (x) | 1911 | 1921 | 1931 | 1941 | 1951 | 1961 |
|---|---|---|---|---|---|---|
| Population in thousands (y) | 12 | 15 | 20 | 27 | 39 | 52 |

Determine the population for the year 1946.

(b) A polynomial passes through the following set of points: — **5** — **CO3**

| $x$ | 0 | 1 | 2 | 5 |
|---|---|---|---|---|
| $f(x)$ | 2 | 3 | 12 | 147 |

Determine the polynomial using Lagrange's formula.