Assignment - 5

Question 1. Evaluate the following integral:

$$\int_{-2}^{4} (1 - x - 4x^3 + 2x^5) dx$$

(a) Using Reimann's sum (midpoint rule) with 6 subintervals.
(b) Using the Gaussian Quadrature method

Question 2. The work produced by a constant temperature, pressure-volume thermodynamic process can be computed as:

$W = \int p dV$ where W is work, p is pressure, and V is volume

Evaluate the work,W (kJ) with the following data:

(a) Trapezoidal rule
(b) Simpson's rule

Pressure(kPa)	336	294.4	266.4	260.8	260.5	249.6	193.6	165.6
Volume(m^3)	0.5	2	3	4	6	8	10	11

Submission Details:

1. Submit the Python script or Jupyter Notebook. Ensure your code is well-documented, with comments explaining the logic behind each step.
2. Submit a PDF file containing the solution of question 1 and question 2