**Mathematical Foundations**

**Instructions**

Please share your answers filled in-line in the word document. Submit code wherever applicable. Mathematical calculations which are manually performed should be uploaded with a picture along with the explanation in a word document.

Please ensure you update all the details:

**Name: \_\_\_\_\_Jaidev Chhabria\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Batch ID: \_\_\_\_DSWEMON 290521\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Topic: Mathematical Foundations**

**Note: Submit pictures of mathematical calculations**

**Grading Guidelines:**

**1. An assignment submission is considered complete only when correct and executable code(s) are submitted along with the documentation explaining the method and results. Failing to submit either of those will be considered an invalid submission and will not be considered for evaluation.**

**2. Assignments submitted after the deadline will affect your grades.**

**Grading:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ans** | **Date** |  |  | **Ans** | **Date** |
| Correct | On time | A | 100 |  |  |
| 80% & above | On time | B | 85 | Correct | Late |
| 50% & above | On time | C | 75 | 80% & above | Late |
| 50% & below | On time | D | 65 | 50% & above | Late |
|  |  | E | 55 | 50% & below |  |
| Copied/No Submission |  | F | 45 |  |  |

* **Grade A: (>= 90):** When all assignments are submitted on or before the given deadline
* **Grade B: (>= 80 and < 90):** 
  + When assignments are submitted on time but less than 80% of problems are completed.

(OR)

* + All assignments are submitted after the deadline.
* **Grade C: (>= 70 and < 80):** 
  + When assignments are submitted on time but less than 50% of the problems are completed.

(OR)

* + Less than 80% of problems in the assignments are submitted after the deadline.
* **Grade D: (>= 60 and < 70):**
  + Assignments submitted after the deadline and with 50% or less problems.
* **Grade E: (>= 50 and < 60):** 
  + Less than 30% of problems in the assignments are submitted after the deadline.

(OR)

* + Less than 30% of problems in the assignments are submitted before the deadline.
* **Grade F: (< 50):** No submission (or) malpractice.

**Problem Statements**

Q1) Find the maximum and minimum values of the function: x^3 - 3x^2 - 9x + 12

Q2) Calculate the slope and the equation of a line which passes through the points (-1, -1) (3, 8)

Q3) Solve for w’(z) when



Q3) Consider Y(x)= 2x^3+6x^2+3x. Identify the critical values and verify if it is the maxima or minima.

Q4) Determine the critical points and obtain relative minima or maxima of a function defined by



y = 2x1^2+2x1x2 + 2x2^2 + 6x