**CS-470 Machine Learning** **Quiz-02**

**Name:** _____ **Reg No:** _____

1. Given the following confusion matrix for a binary classification problem, calculate the Accuracy, Precision, and Recall. **(3 Marks)**

| | **Predicted: NO** | **Predicted: YES** |
|---|---|---|
| **Actual: NO** | 50 | 10 |
| **Actual: YES** | 5 | 35 |

- **Accuracy:** _____
- **Precision:** _____
- **Recall:** _____

2. A medical test for a rare disease has a very high Recall. What does this mean in the context of the test? What is the potential downside if its Precision is low? **(2 Marks)**

3. In a 3-class classification problem (Classes A, B, C), the raw scores (logits) from a Softmax Regression model for one instance are: [2.0, -1.0, 0.5]. Calculate the final probabilities assigned by the Softmax function. (*Show your steps*). **(5 Marks)**

   *Hint: Softmax(z)*$_i = \frac{e^{z_i}}{\sum_j e^{z_j}}$

   **Step 1: Calculate $e^z$ for each class.**

   - $e^{2.0}$ = _____
   - $e^{-1.0}$ = _____
   - $e^{0.5}$ = _____

   **Step 2: Calculate the sum from Step 1.**

   - Sum = _____

**Step 3: Calculate the probability for each class.**

- P(Class A) = _____ / _____ = _____
- P(Class B) = _____ / _____ = _____
- P(Class C) = _____ / _____ = _____