

Part I:

1.a) 1pts- For incomplete/partial proof or missing/incorrect steps or undefined/improper substitutions

**2 pts - For a complete proof with detailed explanation.**

1.b) 1pts- For incomplete/partial proof or missing/incorrect steps or undefined/improper substitutions

**3 pts - For a complete proof with detailed explanation.**

1.c) 1 pts- Correct equation mentioning what all the variables stand for

1.d) 1 pts/2pts - For incorrect calculations/substitutions but correct update equation and correct logic.

**4pts - Correct update equation and correct weights**

1.e) 1pt - For the correct answer but insufficient justification

2pts - For the correct answer and correct justification.

2. 2pts/3 pts - Correct approach but incorrect partial derivatives/ partial derivatives w.r.to incorrect variables, Partial solution

**5pts- Complete and correct solution without any missing steps**

Part II:

1.a) 2pts - Correct explanation.

b) 1pts- Display of images asked for

c) 1pts - Display of the correct eigenfaces

2.a) 2pts- Correct implementation of Logistic Loss

2 pts- Correct implementation of Forward Pass

3pts - Correct implementation of Gradient descent

2pts- dw calculation and update function

1pts- Documentation

**10 pts- Correct and complete implementation with documented code**

b) 2 pts- Valid Loss curves and accuracies

2 pts - Standard Deviation reporting

1 pts- For using Early Stopping

4 pts- Plots for different Learning rates and PCs

1 pts- Labeling the curves

**10 pts- Proper and labeled curves for different PCs and different learning rates.**

c) 2 pts- Valid Loss curves and accuracies

1 pts - Standard Deviation reporting

1 pts- Labeling the curves

1 pts- Proper Explanation and Justification

**5pts - Proper and labeled curves with correct explanation.**

3. a) 3 pts- Valid Loss curves and accuracies

5 pts - Correct Confusion Matrix

2 pts- Labeling the curves with Learning rates and number of PCs

**10 pts - Correct confusion matrix, correct and labeled curves with all the information of lr, # of PCs, correct test results**

b) 2 pts - Comparison or Explanation

2pts- Valid graphs

1 pts- Labeling the graphs

**5 pts- Correct and labeled graphs with proper comparison**

c) Partial points for number of classes shown with labels

**5pts- All graphs with labels**

d) 5 pts- Correct Visualizations and explanation

4. 1 pts- Mention of Individual Contributions