**ACT4311 Homework 2 Answer Sheet**

For Q1 to Q10, please choose the best option and write your answer in the following answer sheet.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question | Q1  (6 points) | Q2  (6 points) | Q3  (6 points) | Q4  (6 points) | Q5  (6 points) |
| Answer | D | C | D | B | A |
| Question | Q6  (6 points) | Q7  (6 points) | Q8  (6 points) | Q9  (6 points) | Q10  (6 points) |
| Answer | B | B | C | C | B |

For Q11, please write your answer in the following box.

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| --- |
| Q11 (10 points) |
| The number of K in K-NN means the number of neighbors in the model, the predictions are based on these neighbors to be made. When K increases, classification accuracy on the training data will decrease.  The K in K-means means the model tries to extract K clusters on the given datasets. In general, the performance metric distortion will decrease as K increases. |

For Q12, please fill in the following tables.

|  |  |  |  |
| --- | --- | --- | --- |
| Q12-1 (9 points) (3 decimal digits) | | | |
|  | Zero-one loss | Logistic loss | Hinge loss |
| f1(x) | 0 | 0.466 | 0 |
| f2(x) | 0 | 0.965 | 0 |
| f3(x) | 0 | 0.761 | 0 |

|  |  |
| --- | --- |
| Q12-2 (3 points) | |
| Loss function | Best classifier among f1(x), f2(x) or f3(x) (could choose multiple) |
| Zero-one loss | f1(x), f2(x) and f3(x) |
| Logistic loss | f1(x) |
| Hinge loss | f1(x), f2(x) and f3(x) |

|  |  |
| --- | --- |
| Q12-3 (3 points) | |
| Loss function | Best classifier among f1(x), f2(x) or f3(x) (could choose multiple) |
| Zero-one loss | f1(x) |
| Logistic loss | f1(x) |
| Hinge loss | f1(x) |

For Q13, please write your answers in the following tables.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q13-1 (5 points) | | | | | |
|  | A | B | C | D | E |
| A | 0 | 5 | 3 | 14.422 | 15.264 |
| B | Skipped | 0 | 4 | 9.434 | 10.770 |
| C | Skipped | Skipped | 0 | 13 | 12.806 |
| D | Skipped | Skipped | Skipped | 0 | 6.403 |
| E | Skipped | Skipped | Skipped | Skipped | 0 |

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| Q13-2 (3 points) |
| A and C |

|  |
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| Q13-3 (7 points) |
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