**18CS601**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **June, 2022** | **Computer Science Engineering** | | |
| **Sixth Semester.** | **MACHINE LEARNING** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *questionfrom each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | what do you mean by well posed learning problem? | CO1 | |  |
|  | b) | Mention the steps in designing a machine learning problem. | CO1 | |  |
|  | c) | Differentiate between Training data and Testing Data | CO2 | |  |
|  | d) | What is  the inductive biased hypothesis space and unbiased learner? | CO2 | |  |
|  | e) | Write the Representational Power of Perceptrons. | CO2 | |  |
|  | f) | Write about over fitting. | CO1 | |  |
|  | g) | What are Bayesian Belief nets? | CO3 | |  |
|  | h) | Explain Random forest. | CO3 | |  |
|  | i) | List any 3 major drawbacks of K-nearest Neighbour learning Algorithm. | CO4 | |  |
|  | j) | What is instance based lazy learning. | CO4 | |  |
| **Unit - I** | | | | | |
| 2. | Consider the following set of training examples:   |  |  |  |  | | --- | --- | --- | --- | | Instance | Classification | A1 | A2 | | 1 | + | T | T | | 2 | + | T | T | | 3 | - | T | F | | 4 | + | F | F | | 5 | - | F | T | | 6 | - | F | T |   (a) What is the entropy of this collection of training examples with respect to the target function classification?  (b) What is the information gain of a2 relative to these training examples? | | CO1 | **10M** | |
|  |  | **(OR)** |  |  | |
| 3. | Give three computer applications for which machine learning approaches seem appropriate and three for which they seem inappropriate. and include a one-sentence justification for each. | | CO1 | **10M** | |
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| **Unit - II** | | | | | |
| 4. | a) | Design a two-input perceptron that implements the boolean function A A ­­¬ B. | CO2 | **5M** | |
|  | b) | Design a two-layer network of perceptrons that implements A XO R B. | CO2 | **5M** | |
|  |  | **(OR)** |  |  | |
| 5. | Consider a two-layer feed forward ANN with two inputs a and b, one hidden unit c, and one output unit d. This network has five weights (w,, web, wd, wdc, wdO), where w,o represents the threshold weight for unit x. Initialize these weights to the values (. 1, .l, .l, .l, .I), then give their values after each of the first two training iterations of the BACKPROPAGATION algorithm. Assume learning rate 17 = .3, momentum a! = 0.9, incremental weight updates, and the following training examples:  a b d  1 0 1  0 1 0 | | CO2 | **10M** | |
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| **Unit - III** | | | | | |
| 6. | a) | |  | | --- | | Explain Naïve Bayes For continuous inputs | |  | | CO3 | **5M** | |
|  | b) | |  | | --- | | Describe Regularization in Logistic Regression. | | CO3 | **5M** | |
|  |  | **(OR)** |  |  | |
| 7. | a) | |  | | --- | | How can you Estimate Parameters For Logistic Regression ? | | CO3 | **5M** | |
|  | b) | |  | | --- | | Illustrate Naïve Bayes Algorithm. | | CO3 | **5M** | |
| **Unit - IV** | | | | | |
| 8. | a) | Explain the K – nearest neighbour algorithm for approximating a discrete – valued function  f : Hn→ V with pseudo code. | CO4 | **5M** | |
|  | b) | |  | | --- | | Discuss about k-Nearest Neighbor learning. | | CO4 | **5M** | |
|  |  | **(OR)** |  |  | |
| 9. | a) | |  | | --- | | Write about sample complexity for finite hypothesis spaces | | CO4 | **5M** | |
|  | b) | Define the following terms with respect to K - Nearest Neighbour Learning : i) Regression ii) Residual | CO4 | **5M** | |

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