**QP Code: R20A31AI01**

**R20**

# Anurag University

## B Tech III Year I-Semester Supplementary Examinations, May-2023
## Course: Essentials of Machine Learning
## (Common AI & AIML)

**Time: 3Hours** **Max Marks: 60**

**Section –A (Short Answer type questions)**

- **Answer all questions:** **(10 x 2 =20 Marks)**

1. List out any four applications of machine learning.
2. Distinguish between over fitting and under fitting.
3. Compare Classification with regression giving an example for each.
4. What is supervised learning?
5. List various clustering techniques.
6. What is clustering? Mention the areas where it can be used.
7. What is Baye's Theorem?
8. Mention any two differences between Bagging and Boosting.
9. List Various activation functions.
10. Compare artificial neuron with biological neuron.

**Section—B (Essay Answer type questions)**

- **Answer all questions:** **(5 x 8 =40 Marks)**

11.A) Discuss various types of machine learning models with examples.

OR

B) Compare Feature Extraction with Feature Selection techniques.

12. A) Given the set of values $X = (3, 9, 11, 5, 2)^T$ and $Y = (1, 8, 11, 4, 3)^T$. Evaluate the regression coefficients.

OR

B) What is logistic regression? Explain with an example.

13.A) Illustrate K means clustering algorithm with an example.

OR

B) Demonstrate Agglomerative Hierarchical clustering with a neat example.

14.A) The following dataset contains factors that determine whether tennis is played or not. Using Naive Bayes classifier, predict the possibilities of play for the day <Sunny, Cool, High, Strong>

| Day | Outlook | Temperature | Humidity | Wind | Play ball |
|---|---|---|---|---|---|
| 1 | Sunny | Hot | High | Weak | No |
| 2 | Sunny | Hot | High | Strong | No |
| 3 | Overcast | Hot | High | Weak | Yes |
| 4 | Rain | Mild | High | Weak | Yes |
| 5 | Rain | Cool | Normal | Weak | Yes |
| 6 | Rain | Cool | Normal | Strong | No |
| 7 | Overcast | Cool | Normal | Strong | Yes |
| 8 | Sunny | Mild | High | Weak | No |
| 9 | Sunny | Cool | Normal | Weak | Yes |
| 10 | Rain | Mild | Normal | Weak | Yes |
| 11 | Sunny | Mild | Normal | Strong | Yes |
| 12 | Overcast | Mild | High | Strong | Yes |
| 13 | Overcast | Hot | Normal | Weak | Yes |
| 14 | Rain | Mild | High | Strong | No |

OR

B) Describe with examples the manner in which random forest algorithm improves classifier accuracy.

15. A) Explain the following with examples:
(a) Single layer feed forward networks
(b) Multi layer feed forward networks

OR

B) What is back propagation? Derive its learning algorithm with a feed forward neural network.