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Roll No .....

**CS-8003(1) (CBGS)**  
**B.E. VIII Semester** Examination, June 2020  
**Choice Based Grading System (CBGS)**  
**Machine Learning**  
*Time : Three Hours*

**Maximum Marks : 70**

- Note:** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) Define Machine learning? Briefly explain the types of learning.  
b) Differentiate between Artificial Intelligence and Machine Learning with suitable example.
2. a) What are the advantages and disadvantages of linear regression model?  
b) The values of independent variable  $x$  and dependent value  $y$  are given below:

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| X | 0 | 1 | 2 | 3 | 4 |
| Y | 2 | 3 | 5 | 4 | 6 |

Find the least square regression line  $y = ax + b$ . Estimate the value of  $y$  when  $x$  is 10.

3. a) Explain with example classification using back propagation algorithm.  
b) What are issues in decision tree learning? How are they overcome?
4. a) Differentiate between supervised, unsupervised and reinforcement learning with example.  
b) Write K means algorithm and separate {5, 11, 19, 27, 23, 25, 6, 18, 2, 8, 10, 12, 31, 29, 4} into 3 clusters.
5. a) What are the elements of reinforcement learning?  
b) Describe the working behaviour of support vector machine with suitable example.
6. a) How is Naive Bayes algorithm useful for learning and classifying text?  
b) Explain Markov and autoregressive model with example.
7. a) Explain EM algorithm in detail.  
b) Explain Normal or Gaussian distribution with an example.
8. a) What is Artificial Neural Network? Explain appropriate problem for Neural Network Learning with its characteristics.  
b) Write short notes on:
  - i) MATLAB
  - ii) Big Data
  - iii) Common Software for Machine Learning

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