OLD BOS

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33705 Roll No.

# B. Tech. Examination 2022-23

## (Even Semester)

## CONCEPTS OF MACHINE LEARNING WITH PYTHON

*Time : Three Hours]* *[Maximum Marks : 60*

**Note :–** Attempt all questions.

## SECTION–A

1. Attempt all parts of the following : 8×1=8

   (a) What is agent, actions and environment in reinforcement learning?

   (b) Define regression.

   (c) What will be the output of the following python code :

*[P.T.O.*

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```
i = 1
while true :
if i% 3 == 0;
break
print (i)
i + = 1
```

(d) What is entropy?

(e) What will be the output of the following :

x<<2;

(f) What is mutation?

(g) List the basic design issues to machine learning.

(h) What is indentation is python?

## SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Explain all the steps of designing a learning system in details.

(b) Write short notes on the following :

(i) Perceptron training rule

(ii) Gradient descent and delta rule

OLD B805



(c) What is the information gain of $a_2$ relative to these training example.

| Instance | Classification | $a_1$ | $a_2$ |
|---|---|---|---|
| 1 | + | T | T |
| 2 | + | T | T |
| 3 | − | T | F |
| 4 | + | F | F |
| 5 | − | F | T |
| 6 | − | F | T |

(d) Explain the concept of EM algorithm. Discuss. What are Gaussian mixtures?

## SECTION–C

**Note :–** Attempt all questions. Attempt any two parts from each question. 5×8=40

3. (a) Illustrate the impact of overfitting in a typical application of decision tree learning.

(b) Describe k-nearest neighbour learning algorithm for continues creal valued target functions.

(c) What a random forest? Explain the concept of bagging and boosting.

*[P. T. O.*

(b) Define the following problem with respect to task, performance and experience :

(i) A checkers learning problem

(ii) A robot driving learning problem

(c) What is tuple? What is difference between list and tuples with example. Explain how to create a dictionary in python?

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