DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Mid Semester Examination – October - 2017

Branch: M.Tech Computer Engineering) **Sem.:- I**

Subject with Subject Code:- Machine Learning (MTCE1102) **Marks: 20**

Date:- **Time:- 1 Hr.**

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(Marks)

Q. No.1 Attempt any one of the following (08)

a.) Consider the task of learning " to play checkers game" Describe it informally in a paragraph in English. Now describe it by stating as precisely as possible the task, performance measure, and training experience. Finally, propose a target function to be learned and a target representation. Discuss the main trade-offs you considered in formulating this learning task.

Solution: The solution is discussed in Tom Mitchell's Book on Machine Learning Section 1.1 Pages 3 to 5.

b.) Let us say you are given the task of building an automated taxi. Define the constraints. What are the inputs? What is the output? How can you communicate with the passenger? Do you need to communicate with the other automated taxis, that is, do you need a "language"?

An automated taxi should be able to pick a passenger and drive him/her to a destination. It should have some positioning system (GPS/GIS) and should have other sensors (cameras) to be able to sense cars, pedestrians, obstacles etc on the road. The output should be the sequence of actions to reach the destination in the smallest time with the minimum inconvenience to the passenger. The automated taxi needs to communicate with the passenger to receive commands and may also need to interact with other automated taxis to exhange information about road traffic or scheduling, load balancing, etc.

Q. No. 2 Attempt any three of the following: (12)

a.) Give three computer applications for which machine learning approaches seem appropriate and three for which they seem inappropriate.

Solution: Table 1.1 on page 3 of Tom Mitchell's Book on Machine Learning

b.) Assume we are given the task to build a system that can distinguish junk e-mail. What is in a junk e-mail that lets us know that it is junk? How can the computer detect junk through a syntactic

analysis? What would you like the computer to do if it detects a junk e-mail—delete it automatically, move it to a different file, or just highlight it on the screen?

What is in a junk e-mail that lets us know that it is junk?

- **An unsoilicited mail is junk email.**

How can the computer detect junk through a syntactic analysis?

Text classification can be used. Some of the features that can be used are name of sender, block mails, system generated, subject headers etc.

What would you like the computer to do if it detects a junk e-mail ?
It Depends. Choice should be specified by the student with justification.

c.) Define the terms: Regression, Association, Clustering, Classification.

Regression: Refer Alpaydm's Introduction to Machine Learning Book Page 9
Association Refer Alpaydm's Introduction to Machine Learning Book Page 4
Clustering Refer Alpaydm's Introduction to Machine Learning Book Page 11
Classification: Refer Alpaydm's Introduction to Machine Learning Book Page 5

d.) Define following terms: Residual, Locally-weighted Regression, Kernel function.

Residual, **Refer Tom Mitchell's Book on Machine Learning** 8.3 Page 236
Locally-weighted **Tom Mitchell's Book on Machine Learning** 8.3 Page 236
Kernel function. **Refer Tom Mitchell's Book on Machine Learning** 8.3 Page 236