

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-8th Semester (CS/IT)

COURSE CODE: L-18B1WCI843

MAX. MARKS: 25

COURSE NAME: Data Analysis

COURSE CREDITS: 3

MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Briefly explain whether Machine Learning can be applied to the following tasks. If so explain which class of machine learning models can be exploited in few lines. a) finger-print based login, b) generating annual sales report, c) guessing future sales of a company, d) detecting patients with similar disease symptoms, e) cleaning data in large database, f) converting image to text, g) compressing photos and h) preparing a good presentation. **[8*0.5 =4 Marks]**

Q2. Can the Machine Learning approaches be considered as optimization problems? If so explain why and if not, what are the differences between traditional optimization problems and Machine Learning? **[3 Marks]**

Q3. Explain the situations where polynomial regression can be applied for a prediction problem. What are the pros and cons of polynomial regression comparing to linear regression? **[4 Marks]**

Q4. In a character recognition dataset, three machine learning models achieve the following performance.

Model Name	Training accuracy	Testing accuracy
Model A	90%	80%
Model B	95%	60%
Model C	60%	50%

Explain the following using valid explanation, a) which model is over-fitting the dataset b) which model is under-fitting the dataset and c) which is the better model among three? **[4 Marks]**

Q5. Develop a logistic regression model for classifying whether a politician can win an election for a given dataset.

S.No	No of hours campaigned	Amount of money spent (INR)	Result
1	300	40000	Won
2	100	90000	Lost
3	500	5000	Lost
4	400	20000	Won
.	.	.	.
.	.	.	.
1000	150	10000	Lost

Briefly describe all the necessary steps in building a classification model starting from the preprocessing until the final model with learned weights (Note: exact computation of weights and gradient is not necessary) **[5 Marks]**

Q6. Briefly explain the following about Ensemble Learning: a) definition, b) functionality, c) how it achieve high accuracy comparing to smaller machine learning models, and d) possible demerits? **[5 Marks]**

*******Best of Luck*******