H   Roll No. ....

TCS–421

B. TECH. (CSE)

(FOURTH SEMESTER)

END SEMESTER

EXAMINATION, June/July, 2022

FUNDAMENTALS OF STATISTICS AND

ARTIFICIAL INTELLIGENCE

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among

(a), (b) and (c) in each main question.

(iii) Total marks in each main question are

twenty.

(iv) Each sub-question carries 10 marks.

1. (a) "Artificial Intelligence is a field of Computer Science which is based on many other fields." Comment on the above statement. Also explain the role of the following in building AI application :   (CO1)

   (i) Control Theory

   (ii) Linguistics

   (b) "Now-a-days Artificial Intelligence based application is used in almost every area of business environment." Justify the above statement giving the usage of Artificial Intelligence in the areas of :   (CO1)

   (i) Healthcare

   (ii) Transport or Travel

   (iii) Agriculture

   (c) Define the term, Agents. Explain the architecture of an Intelligent Agent with the help of a diagram. Also explain the difference between the software agent and robotic agent.   (CO1)

2. (a) Explain how States related to any AI based algorithm can behave as a building block in formulating any problem statement. Discuss the algorithm to be used for any problem-solving methodology. (CO2)

(b) What do you mean by an Expert System ? Give the characteristics of expert systems. Also discuss the limitations of Expert Systems. (CO2)

(c) What do you understand by the term Game Theory ? Discuss Min Max Algorithm of game theory in detail by giving example for the same. (CO2)

3. (a) Explain the term Data Analysis with the help of an example. Discuss the various technologies that can be used by any data scientist. Explain the difference between Data Engineer and Data Analyst. (CO3)

(b) "Business Intelligence can be represented as a subset of Artificial Intelligence." Comment on the above statement. Also give the difference between Business Intelligence and Data Science.   (CO3)

(c) What is Data Scientist ? Explain all the role and responsibility of Data Scientist in detail with the help of example.   (CO3)

4. (a) What do you understand by the term Statistical Modelling ? Explain all the techniques available for statistical modelling in detail with the help of an example.   (CO4)

(b) Define the terms Standard Deviation and Variance. Calculate the Standard Deviation and Variance for the following data :   (CO4)

Class Interval	Frequency
0—10	27
10—20	10
20—30	7
30—40	5
40—50	4
50—60	2

(c) Discuss the following functions in detail with the help of an example : (CO4)

(i) summary( )

(ii) head( )

(iii) read_csv( )

(iv) describe( )

5. (a) What do you mean by Descriptive Statistics ? Name and explain two approaches for descriptive statistics. With respect to analysis explain the difference between univariate, bivariate and multivariate analysis. (CO5)

(b) Define the terms Population and Samples with respect to analysis. Give examples for each. "Outliers can effect the analysis and its value very strongly." Explain the statement defining the term Outlier, also give the explain to support the above statement. (CO5)

(c) Write short notes on the following : (CO5)

(i) Linear Regression

(ii) Classification

(iii) Correlation and Covariance

430