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20CSE731A

New Horizon College of Engineering, Bangalore

Autonomous College affiliated to VTU, Accredited by NAAC with 'A' Grade& NBA

Makeup Examination May 2022

FUNDAMENTALS OF DATA SCIENCE

Duration: **3 hrs** Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

Module 1

1 a)	Describe the interdisciplinary interplay involved in data science through a Venn diagram.	**10**	**L1**	**CO1**
b)	Illustrate how educational data science could empower the educators?	**5**	**L3**	**CO1**
c)	*"Facebook has become a hub of innovation where it has been using advanced techniques in data science to study user behavior and gain insights to improve their product."* Draw any ONE of infographic, which you like the most in Facebook and also justify how it quantizes the particular information in data science perspectives.	**5**	**L3**	**CO1**

OR

2 a)	List the essential elements of SIX – steps of data science life cycle. Also identify and annotate the steps for"Uber case study which uses the data to make rides better".	**10**	**L1**	**CO1**
b)	How to use the *Predictive and prescriptive analytics* in data science?	**5**	**L3**	**CO1**
c)	**Compute the levels of measurement of below mentioned data:**	**5**	**L3**	**CO1**

i. Commuting times to work _____
ii. Ages (in years) of FDS class students _____
iii. Ice cream flavor preference _____
iv. Years of important historical events _____
v. Instructors classified as: Easy, Difficult or Impossible _____

Module 2

3 a)	Predict the use of NumPy's vectorized functions for performing optimized numerical computations on arrays. Also compare the performance of a simple non-vectorized computation to a vectorized one.	**10**	**L2**	**CO2**
b)	Derive a Numpy code to calculate the determinants, traces, rank and nullity of a matrix.	**5**	**L4**	**CO2**
c)	Examine the inner product of two real arrays <s,s> and check whether it is a positive definite or not. S = [2i 3+3i -i]	**5**	**L4**	**CO2**

OR

4	Predict the Euclidean Distance, Manhattan Distance and Minkowski distances between the data points P (1, 2, 3) and Q (4, 5, 6) with the help of Numpy code.	**10**	**L2**	**CO2**
b)	Identify how the hyperplane works as a decision boundary to help in classifying data point's in data science. Also Find an equation for the plane passing through the points Q (−1, 1, 2), R (−4, 2, 2) and S (−2, 1, 5).	**5**	**L4**	**CO2**
c)	"Decomposing a matrix in terms of its eigenvalues and its eigenvectors gives valuable insights into the properties of the matrix". Investigate on this vector and scalar value by using the python code.	**5**	**L4**	**CO2**

Module 3

5 a)	Draw the usage of Posterior Probability. Also compute the solution for the given problem using the Bayes' theorem. The Medical Test involves a genetic test: 1% of people have a certain genetic defect. 90% of tests for the gene detect the defect (true positives). 9.6% of the tests are false positives. If a person gets a positive test result, What are the odds they actually have the genetic defect?	**10**	**L3**	**CO3**
b)	Compute using Poisson Discrete Random Variable distributions: Some vehicles pass through a junction on a busy road at an average rate of 300 per hour. i. Find out the probability that none passes in a given minute. ii. What is the expected number of passing in two minutes? iii. Find the probability that this expected number found above actually pass through in a given two-minute period.	**10**	**L3**	**CO4**

OR

6 a)	I. Illustrate whether the statement describes inferential statistics or descriptive statistics: i. The average age of the students in a statistics class is 21 years. ii. The chances of winning the Manipur Lottery are one chance in twenty-two million. iii. There is a relationship between smoking cigarettes and getting emphysema. iv. From past figures, it is predicted that 39% of the registered voters in Karnataka will vote in the June primary. II. For the studies described, compute the population, sample, population parameters, and sample statistics: **"In a USA Today Internet poll, readers responded voluntarily to the question "Do you consume at least one caffeinated beverage every day?"**	**10**	**L3**	**CO3**

b) ANOVA: Suppose the Benz wants to examine the safety of compact cars, midsize cars, and full-size cars. It collects a sample of three for each of the treatments (cars types). Using the hypothetical data provided aside, *Compute whether the mean pressure applied to the driver's head during a crash test is equal for each types of car. Use α = 5%.*

Compact cars	Midsize cars	Full-size cars
643	469	484
655	427	456
702	525	402

10 L3 CO4

Module 4

7a) Derive the python code for the dataset having Average_Pulse and Calorie_Burnage values using a Linear Regression Using One Explanatory Variable. **10 L4 CO5**

b) Characterize the important trade-offs between **K-NN and SVM** algorithms. **Also investigate the case study using KNN for predicting results:** **10 L4 CO5**

There is a Car manufacturer company that has manufactured a new SUV car. The company wants to give the ads to the users who are interested in buying that SUV. So for this problem, we have a dataset that contains multiple users' information through the social network. The dataset contains lots of information but the **Estimated Salary** and **Age** we will consider for the independent variable and the **Purchased variable** is for the dependent variable.

Below is the dataset:

User ID	Gender	Age	EstimatedSalary	Purchased
15624510	Male	19	19000	0
15810944	Male	35	20000	0
15668575	Female	26	43000	0
15603246	Female	27	57000	0
15804002	Male	19	76000	0
15728773	Male	27	58000	0
15598044	Female	27	84000	0
15694829	Female	32	150000	1
15600575	Male	25	33000	0
15727311	Female	35	65000	0
15570769	Female	26	80000	0
15606274	Female	26	52000	0
15746139	Male	20	86000	0
15704987	Male	32	18000	0
15628972	Male	18	82000	0
15697686	Male	29	80000	0
15733883	Male	47	25000	1
15617482	Male	45	26000	1
15704583	Male	46	28000	1
15621083	Female	48	29000	1
15649487	Male	45	22000	1
15736760	Female	47	49000	1

OR

8 a) Derive K-means clustering procedure to divide the data into 2-clusters. The datasets are as follows. **10 L4 CO5**

Dataset

A	1	2	2	3	4	5
B	1	1	3	2	3	5

b) Examine the PCA procedure to reduce the number of variables in a data set, while preserving as much information as possible. **10 L4 CO5**

Module 5

9 a) Evaluate the components of Tableau architecture & server in detail. **10 L5 CO6**

b) Interpret about the data connectors to provide an interface to connect external data sources to Tableau Data Server. **10 L5 CO6**

OR

10a) Recommend the order of operations in which the filters are executed to perform the actions on view in Tableau. **10 L5 CO6**

b) How to decide choosing the charts to analyze data using Tableau? Evaluate the steps to build charts automatically with ask data as well as customized fields in the data pane. **10 L5 CO6**

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20CSE733A

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Makeup Examination May 2022

Cyber Security, Forensics and Law

Duration: **3 hrs** Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

	Module 1			
1 a)	Define cybercrime. How do we classify cybercrimes?	10	L1	CO1
b)	Identify the phases involved in planning a cybercrime by an attacker.	10	L1	CO1
	OR			
2 a)	Define cyber terrorism. Who are the different types of cyber criminals?	10	L1	CO1
b)	Describe Cyber stalking in detail	10	L1	CO1
	Module 2			
3 a)	Explain SQL Injection attack	10	L2	CO2
b)	Discuss key loggers and their different types	10	L2	CO2
	OR			
4 a)	Explain Steganography and discuss how it is different from Cryptography	10	L2	CO2
b)	Compare the levels of DoS Attacks with an illustration.	10	L2	CO2
	Module 3			
5 a)	Discuss the challenges to Indian law and Cybercrime scenario in India	10	L2	CO3
b)	Illustrate the positive aspects of the ITA 2000	10	L3	CO3
	OR			
6 a)	Explain the need for cyber laws in India.	10	L2	CO3
b)	Illustrate the weak areas in Indian IT Act 2000.	10	L3	CO3
	Module 4			
7a)	Illustrate the challenges in computer forensics.	10	L3	CO4
b)	Derive some of the best practices in handling digital evidence.	10	L4	CO5
	OR			
8 a)	Illustrate the phases in computer forensics.	10	L3	CO4
b)	Examine the relevance of OSI 7-layer model to computer forensics.	10	L4	CO5
	Module 5			
9 a)	Derive the two ways in which PDA forensics tools acquire data.	10	L4	CO6
b)	Identify the key organizational guidelines on cell phone forensics.	10	L4	CO6
	OR			
10a)	Examine the role of digital forensics in litigations.	10	L4	CO6
b)	Identify some of the techno-legal challenges involved in collecting the evidence from hand held devices.	10	L4	CO6

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20CSE742A

New Horizon College of Engineering, Bangalore

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Makeup Examination May 2022

DEEP LEARNING

Duration: **3 hrs** Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

	Module 1			
1 a)	Explain the Feed Forward Neural Network? How does a Feed Forward Neural Network works?	10	L2	CO1
b)	Illustrate the following Hyper Parameters with an example. i) Number of Hidden Layers ii) Learning Rate iii) Momentum iv) Activation Functions	10	L3	CO1
	OR			
2 a)	Distinguish between i) Neural Networks and Deep Learning ii) Activation Functions and Loss Functions	10	L2	CO1
b)	Illustrate the Perception Learning Algorithm with an example.	10	L3	CO1
	Module 2			
3 a)	Discuss the Deep Learning uses in detail.	10	L2	CO2
b)	Characterize the Core Components of Common Architectural Principles of Deep Network.	10	L4	CO2
	OR			
4 a)	List and Explain the Applications of Deep Learning in Artificial Intelligence.	10	L2	CO2
b)	Examine the types of Auto encoders.	10	L4	CO2
	Module 3			
5 a)	Characterize the Technique of LSTM in Recurrent Neural Networks.	10	L4	CO3
b)	Interpret the architecture of Convolution Neural Network with an illustration.	10	L5	CO4
	OR			
6 a)	Characterize the Recurrent Neural Network in detail.	10	L4	CO3
b)	Justify the following Fundamental Deep Learning Architectures with example i) Unsupervised Pre-Trained Networks ii) Recursive Neural Network	10	L5	CO4
	Module 4			
7a)	Explain different Weight Initialization Technique?	10	L2	CO5
b)	How do you fine tune a Deep Learning Model, Justify?	10	L5	C05
	OR			
8 a)	Explain the following terms i) Output Layer ii) Working with Layer Count iii) Parameter Count iv) Memory	10	L2	CO5
b)	Evaluate the process to configure the number of layers and nodes in a Neural Network?	10	L5	CO5
	Module 5			
9 a)	Explain Computer Vision and Speech Recognition in Deep Learning?	10	L2	CO6
b)	Classify the deep learning applications used in healthcare for diagnosing the diseases?	10	L3	CO6
	OR			
10a)	Explain the Recommender Systems in Social Networks?	10	L2	CO6
b)	Classify the Large-Scale Deep Learning is used for building Intelligent Computer?	10	L3	CO6

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20CSE743A

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Makeup Examination May 2022

ROBOTICS

Duration: **3 hrs** Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

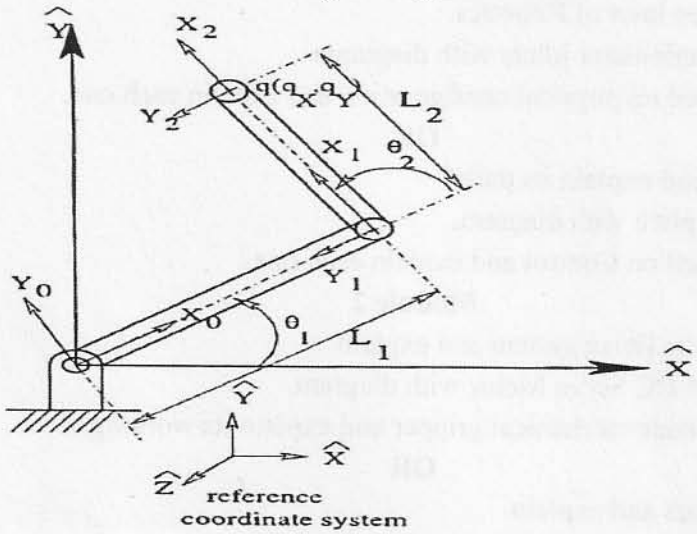
	Module 1			
1 a)	Describe Robot and three laws of Robotics.	7	L1	CO1
b)	Discuss three Robot Manipulator joints with diagrams.	7	L2	CO1
c)	Classify the Robots based on physical configuration and explain each one.	6	L3	CO1
	OR			
2 a)	Draw Robot Anatomy and explain its parts.	7	L1	CO1
b)	Discuss Roll, Yaw and pitch with diagram.	7	L2	CO1
c)	Classify the Robots based on Control and explain each one.	6	L3	CO1
	Module 2			
3 a)	Classify the three Robotic Drive system and explain.	7	L3	CO2
b)	Illustrate the working of DC Servo Motor with diagram.	7	L3	CO2
c)	Define and draw two-finger mechanical gripper and explain its working	6	L1	CO2
	OR			
4 a)	Classify the End effectors and explain.	7	L3	CO2
b)	Illustrate how the magnetic fields produced by two windings of AC motor keep continuous motion of rotation.	7	L3	CO2
c)	Define permanent magnet stepper motor and explain its working with a neat diagram.	6	L1	CO2
	Module 3			
5 a)	Describe the different features of the Sensors.	7	L1	CO3
b)	Categorize the Robotic applications of Machine Vision.	7	L3	CO3
c)	Organize an absolute encoder for finding shaft angle and explain its working with a diagram.	6	L4	CO3
	OR			
6 a)	Describe the working principle of LVDT with a diagram.	7	L1	CO3
b)	Consider a vision system using a videocon tube. An analog video signal is generated for each line of the 512 line comprising the faceplate. The Sampling capability of A/D converter is 100ns.This is the cycle time required to complete the A/D conversion process for one pixel. Using the American standard of 33.33ms to scan the entire faceplate consisting of 512 lines, Compute the Sampling rate and the number of pixels that can be processed per line.	7	L3	CO3
c)	Identify a proximity sensor to detect metallic and non metallic objects and explain its working with a diagram.	6	L4	CO3

Module 4

7a)	Explain composite matrix in Cylindrical Coordinate system.	6	L2	CO4
b)	Identify DH parameters to prove $^{i-1}_{i}T=ROT(Z,\Theta_i)\ TRANS(Z,d_i)\ ROT(X,\alpha_i)\ TRANS(X,a_i)$	6	L3	CO4
c)	Organize the robot programming language commands to direct the robot for pick and place an objects.	8	L4	CO6

OR

8 a)	Explain composite matrix in Spherical Coordinate system.	6	L2	CO4
b)	Compute forward kinematics for the given figure	6	L3	CO4



c)	Analyze the different robotic programming languages and its features.	8	L4	CO6

Module 5

9 a)	Explain Automated Guided Vehicles.	7	L2	CO5
b)	Classify the different economic analysis of Robots in detail.	7	L3	CO5
c)	Identify the different direct costs associated with robot project.	6	L4	CO5

OR

10a)	Explain Rail Guided Vehicles.	7	L2	CO5
b)	Classify the different Safety sensors and safety monitoring of Robots in detail.	7	L3	CO5
c)	Identify the different in-direct costs associated with robot project.	6	L4	CO5

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20NHOP710

New Horizon College of Engineering, Bangalore

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Makeup Examination May 2022

DATA ANALYTICS

Duration: **3 hrs** Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

	Module 1			
1 a)	Write short notes on dimensional modeling	10	L1	CO1
b)	Explain in detail about fact constellation schema	10	L2	CO1
	OR			
2 a)	Describe aggregate fact tables	10	L1	CO1
b)	Discuss about different phases in data analytics	10	L2	CO1
	Module 2			
3 a)	Illustrate the use aggregate function in SQL with a suitable example	10	L3	CO2
b)	Draw a neat diagram and explain high availability feature of Vertica	10	L3	CO2
	OR			
4 a)	Classify different features of Vertica analytics platform	10	L3	CO2
b)	Illustrate the uses of encoding and compression mechanism	10	L3	CO2
	Module 3			
5 a)	Describe replication and segmentation	10	L1	CO3
b)	Explain in detail about the role of data base designer in design process	10	L2	CO4
	OR			
6 a)	Write short notes on WOS and ROS	10	L1	CO3
b)	Summarize the working of COPY command with a neat diagram	10	L2	CO4
	Module 4			
7a)	Analyze different Google analytics tools with suitable examples	10	L4	CO5
b)	Evaluate the different steps of closed loop model with a suitable diagram	10	L5	CO5
	OR			
8 a)	Examine web analytics process in detail with a neat diagram	10	L4	CO5
b)	Interpret the different reports generated on Google analytics	10	L5	CO5
	Module 5			
9 a)	Examine different methods of marketing analytics	10	L4	CO6
b)	Evaluate need based segmentation with an example	10	L5	CO6
	OR			
10a)	Analyze the different stages in target marketing strategy development	10	L4	CO6
b)	Evaluate different steps to be followed in marketing analytics with suitable examples	10	L5	CO6