

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (Sem.-4)

MACHINE LEARNING AND DATA ANALYTICS USING PYTHON

Subject Code : PGCA1976

M.Code : 91855

Date of Examination : 17-11-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

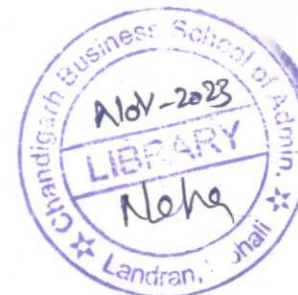
- a) Take an example to differentiate between supervised and unsupervised learning.
- b) What are the assumptions of linear regression models?
- c) How is the value of k determined in KNN algorithm?
- d) Outline the features of random forest classifier.
- e) When is Principal Component Analysis required in machine learning?
- f) How do we handle missing data in Python?
- g) What are the features of Matplotlib and why is it essential in machine learning systems?
- h) Mention types of data frames used in Pandas for handling datasets.
- i) Illustrate Numpy arrays with an example.
- j) What are different operators used in python programming?

SECTION-B

2. Explain the concept of reinforcement learning with the help of a block diagram showing its important components and function of each.
3. How and where is decision tree used? Discuss the concept of entropy, information gain and Gini index and their use in decision tree formation.
4. What is regression analysis? Explain logistic regression using an example graph.
5. Outline the working of random forest classifier by taking a suitable dataset ex.

SECTION-C

6. Why area arrays are used in data analytics? Discuss the concept of arrays and array indexing in numpy?
7. Take an example and discuss the merging, joining and concatenating operations in python programming.
8. Describe various types of data types and their characteristics used in python programming.
9. Write short notes on the following in the context of Python programming :
 - a) Control structures and Modules
 - b) Data input and Output in Pandas .



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Total No. of Questions : 09

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MCA (Sem.-4)
ADVANCED WEB TECHNOLOGIES

Subject Code : PGCA1958

M.Code : 91856

Date of Examination : 21-11-2023

Time : 3 Hrs.

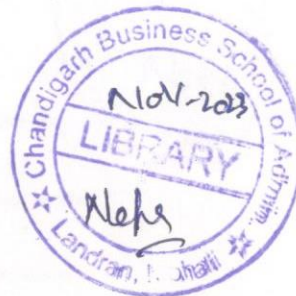
Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

- I. Answer the following :
- What is content management system?
 - What is Cookie?
 - What is the main use of session in PHP?
 - What is HTTP?
 - Why ReactJS is used?
 - What is the functionality of node package manager?
 - What is Node.js?
 - Why is jQuery used for?
 - What is Ajax?
 - What is the major benefit of using Ajax?



SECTION-B

2. Answer the following :
 - a) What are the uses and benefits of content management system? Explain in detail.
 - b) List and explain the types of web services.
3. Write a PHP program to read the data from web form controls, also demonstrate the server side validation(s).
4. Answer the following :
 - a) Differentiate between indexed array and associative arrays.
 - b) Write a PHP script that removes last word from a string.
5. How are cookies created and accessed in PHP? Explain with the help of a PHP Script.

SECTION-C

6. What is XML? What is an XML namespace? Explain in detail.
7. What is Bootstrap? What are the key components of Bootstrap? Explain in detail.
8. How to create components in ReactJS? Explain in detail.
9. Answer the following :
 - a) How to retrieve the page content in jQuery? Explain.
 - b) How to manipulate page content in jQuery? Explain.

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MCA (Sem.- 4)
IOT & BLOCKCHAIN TECHNOLOGY

Subject Code : PGCA1967

M. Code : 91862

Date of Examination: 30-11-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

I. Write short notes on :

- a) Describe provide examples of real-world applications where IoT technology is making a significant impact.
- b) What are some key security considerations when deploying IoT devices and systems?
- c) How do IoT devices collect and transmit data to centralized systems for analysis and decision-making?
- d) How does Low-Power, Wide-Area Networking (LPWAN) play a role in IoT connectivity?
- e) Can you discuss the potential challenges and risks associated with the widespread adoption of IoT technology in various industries?
- f) How does blockchain technology ensure data immutability and transparency in transactions?
- g) What is the difference between public and private blockchains and provide an example of each?

h) How does the process of mining work in the context of cryptocurrencies?

i) What is the role of consensus mechanisms, such as Proof of Work (PoW), in preventing double spending in the Bitcoin network.

j) Mention the security features that make cryptocurrencies resistant to counterfeiting and fraud.

SECTION-B

2. How does Bluetooth Low Energy (BLE) enhance the usability of IoT devices in terms of power efficiency and compatibility with mobile devices?
3. Examine the ethical and privacy considerations associated with IoT applications, especially in contexts where personal data is collected and transmitted. How can these concerns be addressed?
4. Compare and contrast the various communication models used in IoT. What are their advantages and disadvantages?
5. Explain the role of Zigbee in industrial IoT (IIoT) and its suitability for applications requiring low- power, long-range connectivity.

SECTION-C

6. Compare and contrast the speed, cost, and scalability of Bitcoin transactions with traditional banking or payment systems. What are the trade - offs involved?
7. Examine the potential uses of blockchain and cryptocurrencies beyond financial applications, such as voting systems, and identity verification. What are the benefits and challenges of adopting blockchain in these contexts?
8. Evaluate the advantages and disadvantages of using cryptocurrencies as a means of payment compared to traditional fiat currencies. What are the key obstacles to widespread cryptocurrency adoption in daily transactions?
9. Analyze the security features and mechanisms that ensure the integrity of payments and transactions within the Bitcoin network. What role do miners play in this process?

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MCA (Sem.-4)

IOT & BLOCKCHAIN TECHNOLOGY

Subject Code : PGCA1967

Paper ID : 91862

Date of Examination : 18-05-23

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1) Write short notes on :

- What is IoT?
- Name the communication protocols used in IoT architecture.
- What is the purpose of a functional block?
- Mention few domain specific applications of IoT.
- What is a sensor and an actuator in IoT system?
- Outline the characteristics of a smart contract.
- How transaction in bitcoin network takes place?
- Differentiate block propagation and block delay.
- What is block mining?
- How is blockchain used in KYC based applications?



SECTION-B

- 2) Describe the communication models and communication APIs in IoT framework.
- 3) Briefly explain the different IoT levels and deployment templates.
- 4) Discuss the protocols: MQTT, CoAP and ZigBee used in IoT communication model.
- 5) Elaborate any two application domains where use of IoT can be beneficial and how?

SECTION-C

- 6) What is a bitcoin script? Discuss Bitcoin P2P network components.
- 7) Describe various security attacks in blockchain highlighting 50% majority attack.
- 8) Explain in detail how can Distributed Consensus works on a blockchain network?
- 9) **Write short notes on the following:**
 - a) Payments and double spending problem
 - b) Public vs. Private blockchain.

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MCA (Sem.-4)

MACHINE LEARNING AND DATA ANALYTICS USING PYTHON

Subject Code : PGCA-1976

Paper ID : 91855

Date of Examination : 22-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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SECTION-A**1. Write short notes on :**

- a) Explain the difference between simple and multiple linear regression.
- b) Name all models which can be implemented for using the linear classification.
- c) Can we do multiclass classification using logistic regression? Explain.
- d) Differentiate between KNN for classification versus regression.
- e) Explain the working of decision trees briefly.
- f) What are the drawbacks of a decision tree?
- g) What is a DataFrame in Pandas? Write the command to import a CSV file.
- h) What is the full form of Numpy?
- i) How to decide whether the PCA will be employed?
- j) What is unsupervised learning? Explain with an example.

SECTION-B

2. a) Explain the principle of bagging in Random Forest with an example. Define the out-of-bag error.
b) What are the advantages of Random Forests over Decision Trees?
3. a) How is the principal component analysis method helpful in reducing the complexity of the model being trained?
b) What is the role of the Sigmoid function in logistic regression?
4. a) What is the functionality of hidden layers in a neural network?
b) What is a perceptron? Explain the hyperparameter tuning in neural network training.
5. Consider the following training set that classifies the output variable play tennis as Yes or No depending upon weather conditions such as Outlook, Temperature, Humidity, and Windy Status.

S. No.	Outlook	Temperature	Humidity	Windy	Play Tennis
1	Sunny	Hot	High	Weak	No
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rainy	Mild	High	Weak	Yes
5	Rainy	Cool	Normal	Weak	Yes
6	Rainy	Cool	Normal	Strong	No
7	Overcast	Cool	Normal	Strong	Yes
8	Sunny	Mild	High	Weak	No
9	Sunny	Cool	Normal	Weak	Yes
10	Rainy	Mild	Normal	Weak	Yes
11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rainy	Mild	High	Strong	No

Using Naive Bayes Classifier, classify whether, on a Rainy, Mild, High Humidity, and Windy day, we can play tennis or not.

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11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rainy	Mild	High	Strong	No

Using Naive Bayes Classifier, classify whether, on a Rainy, Mild, High Humidity, and Windy day, we can play tennis or not.

SECTION-C

6. Write the Python code for printing the first N prime numbers.
7.
 - a) What are the various functionalities of Pandas library?
 - b) What is the difference between series and Data Frames? Explain using examples.
8.
 - a) Explain the usage of the Matplotlib library using examples.
 - b) When do we need to plot histograms versus pie charts? Discuss with examples.
9.
 - a) How to handle missing data using Pandas?
 - b) Discuss the usage of joining, concatenation, and merging in Pandas.



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MCA (Sem.-4)

ADVANCED WEB TECHNOLOGIES

Subject Code : PGCA1958

M.Code : 91856

Date of Examination : 25-05-23

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- What is client-side scripting?
- How strings are used in PHP?
- Why cookies are used?
- What is the meaning of content management system.
- What is the meaning of datepicker?
- What are disadvantages of AJAX?
- What are the advantages of using xml?
- What is a Bootstrap Container and how does it work?
- What is a breadcrumb in Bootstrap?
- What is component API?



SECTION-B

2. What are the main characteristics of a PHP variable? What are the variable-naming rules you should follow in PHP?
3. Differentiate between following using example :
 - a) CHAR and VARCHAR
 - b) CHAR_LENGTH and LENGTH?
4. What are the various types of CMS? Discuss alongwith its usage and benefits.
5. Discuss any five basic PHP errors/problems alongwith example.

SECTION-C

6. What is the difference between synchronous and asynchronous requests in AJAX? Explain with an example.
7. What is a well formed XML document? What is XML DOM, explain with an example.
8. How is jQuery different from other javascript frameworks? List down any four features of jQuery.
9. Discuss the various components of Bootstrap in detail.

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