1812N996

Candidate's Seat No : _____

MCA Sem.-3 Examination
1.Deep Learning

Time : 3-00 Hours]

December-2024

[Max. Marks : 50

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

SECTION – I

Q.1 Answer the following in short: (Any - 3)   9 Marks
1) What is the hidden layer of a NN?
2) Explain different pooling techniques such as max pooling and average pooling.
3) Explain the difference between shallow networks and deep networks.
4) Explain the difference between L1 and L2 regularization.

Q.2 Answer in detail: 10 Marks
1) In a CNN architecture, if you replace a standard convolution operation with a depthwise separable convolution, how will the computational cost and the number of parameters change? (Use logical reasoning to support your answer)
2) Discuss the impact of stride on the convolution operation in CNNs. How does changing the stride length influence the output feature map size and the computational load? Illustrate your answer with examples.

OR

1) Describe the role of pooling in CNNs. Compare and contrast different pooling techniques such as max pooling, average pooling and global pooling. How do these techniques affect the performance and computational efficiency of CNNs?
2) If you observe that your CNN is struggling with vanishing gradients during training, what logical steps would you take to mitigate this issue? Discuss potential modification to the network architecture, initialization, or training process.

Q.3) Draw and explain the architecture of RNN   5 Marks

(labelling all links and nodes).

OR

Q.3) Draw and explain the architecture of LSTM (labelling all the links and nodes).

Section – II

Q.4 Answer in brief: (Any – 2)   **8 Marks**

1) Explain how Stochastic Gradient Descent with momentum optimization algorithm works.
2) Why do we need an activation function in neural network?
3) What is Vanishing gradient and Exploding gradients?

Q.5 Answer in detail:

12 Marks

1) Discuss the concept of adversarial training as a regularization technique. Explain its benefits and limitations.
2) Discuss the fundamental concepts of machine learning focusing on supervised and unsupervised learning techniques. How do these concepts lay the foundation for understanding deep learning? Provide examples to illustrate your points.

OR

1) How would you expect the performance of a machine learning model to change if the dimensionality of the input data were doubled? What specific challenges might arise, and how could they be addressed?
2) Describe the architecture and functioning of a vanilla multilayer perceptron (MLP). How does an MLP differ from other types of neural networks, and what are its strengths and limitations? Include a discussion on activation functions used in MLPs.

Q. 6) Explain Sparse interaction in detail with example.   **5 Marks**

OR

Q. 6) Explain how to overcome the problem of Vanishing Gradient.

Time : 3-00 Hours]   [Max. Marks : 50

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- Make Assumptions wherever necessary.

Section : I

Q-1 Attempt the following : (Each Question carries 2 marks)   8
  a. What is Angular? What are its purposes?
  b. What is the difference between JSON and XML?
  c. What is the difference between one-way and two-way data binding?
  d. What is filter? state the types of filter

OR

Q-1 Attempt the following : (Each Question carries 2 marks)   8
  a. What is Callback, Asynchronous and promises?
  b. State the features of angular.
  c. What is component and how to create it?
  d. State the advantages and disadvantages of Java Script

Q-2 Answer the following questions in brief : (Each Question carries 3 marks)   9
  a. Describe the difference between a component and a directive in Angular.
  b. Explain the difference between the ngIf and ngSwitch directives in Angular.

OR

  b. Explain the difference between the ngFor and ngForOf directives in Angular.
  C. Explain the concept of services in Angular and how they are used.

Q-3 Attempt the following (Each Question carries 4 marks):   8
  a. How do you use filter() method to filter an array?
  b. Create an Angular SPA that meets the following requirements:
     a. Takes an integer input from the user
     b. Checks whether the input number is prime
     c. If it is prime the up to the given number print Fibonacci series

OR

Q-3 Attempt the following (Each Question carries 4 marks):   8
  a. What is dependency injection in Angular JS and what is its purpose?
  b. Explain ngIf and ngShow directive in angular with example.

P.T.O

Section : II

Q-4 Attempt the following (Each Question carries 2 marks)   8
   a. What is the purpose of the @NgModule decorator in Angular?
   b. What is the difference between var and let in TypeScript?
   c. What is class in JS? Write its shot example
   d. What is module in angular?

OR

Q-4 Attempt the following (Each Question carries 2 marks):   8
   a. What is the purpose of the ngModel directive in Angular?
   b. What is the purpose of the @Injectable decorator in Angular?
   c. How do you use the HttpClient service to make HTTP requests in Angular?
   d. How do you create a New Node.js module?

Q-5 Answer the following questions in brief (Each Question carries 3 marks)   9
   a. What is angular JS? Why we have to choose angular?
   b. What is service in angular.

OR

   b. What is JSON? Compare it with XML and CSV.
   c. Explain MVC in angular JS.

Q-6 Attempt the following (Each Question carries 4 marks):   8
   a. How do you use require() to import modules in node.js?
   b. How do you use the ng-model directive to bind data to form inputs? Explain it with example

OR

Q-6 Attempt the following (Each Question carries 4 marks):   8
   a. Describe how to use the @ViewChild decorator to access a child component in Angular
   b. "Create an Angular SPA that meets the following requirements:
   - Takes an integer input from the user
   - Checks whether the input number is prime
   - If it is prime the up to the given number print Fibonacci series
   - Uses angular best practices and follows the angular style guide.