COLLEGE OF ENGINEERING TRIVANDRUM

DEPARTMENT OF COMPUTER APPLICATIONS

Third Semester M.C.A Degree

Second Series Examination Feb-2022

20MCA283: DEEP LEARNING

Time: 1 hr **Max. Marks: 20**

PART-A

(Answer All Questions. Each question carries 2.5 marks)

1. What is a Convolutional Neural network? What are the different layers in CNN?
2. What is max pooling in the context of CNN?
3. Distinguish between Sparse encoders and Denoising encoders.
4. Briefly explain the architecture of Generative Adversarial Network(GAN).

(Total: 4*2.5= 10 marks)

PART-B

(Each question carries 5 marks)

5. Explain the Convolutional Neural network architecture and its layers in detail.

OR

6. How does Lenet5 work?

7. What are Autoencoders? Explain its types.

OR

8. Explain how a GAN is trained?

(Total: 2*5= 10 marks)

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20MCA263: CYBER SECURITY & CRYPTOGRAPHY

Time: 1 hr **Max. Marks: 20**

PART-A

(Answer All Questions. Each question carries 2.5 marks)

1. Compare strong collision resistance and weak collision resistance property of Hash function.
2. Write a short note on hashcash.
3. Differentiate between transport mode and tunnel mode in IPSecurity
4. Briefly describe the process of securing electronic transactions.

(Total: 4*2.5= 10 marks)

PART-B

(Each question carries 5 marks)

5. What do you mean by Message Authentication? Explain Cipher-Based Message Authentication code (CMAC).

OR

6. Describe how does signature forgering can be done while using hash function.

7. Consider a Diffie-Hellman scheme with a common prime q=13 and a primitive root α=7.
   a) Show that 7 is the primitive root of 13.
   b) If Alice has a public key $Y_A = 5$, what is Alice's private key X_A?
   c) If Bob has a public key Y_b=12, what is the secret key K shared with Alice?

OR

8. Explain any one protocol used in E-mail for security.

(Total: 2*5= 10 marks)

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DEPARTMENT OF COMPUTER APPLICATIONS

Third Semester M.C.A Degree

Second Series Examination February-2022

20MCA201: DATA SCIENCE & MACHINE LEARNING

Time: 1 hr **Max. Marks: 20**

PART-A

(*Answer all questions. Each question carries 2.5 marks*)

1. What is meant by maximum margin hyperplane? Explain.
2. Explain the Ordinary Least Square method in regression.
3. What do you mean by information gain and entropy? How is it used to build the decision trees? Illustrate using an example.
4. With the aid of a diagram, explain the concept of an artificial neuron.

(4 x 2.5= 10 marks)

PART-B

(Answer any *ONE FULL question from each Module*)

MODULE III

5 .Determine the regression equation by finding the regression slope coefficient and the intercept value using the following data. Assume 'Y' is the independent variable.

X	55	60	65	70	80
Y	52	54	56	58	62

6. Construct a decision tree (Only for 2 levels) for the dataset given below.

Gender	Car Ownership	Travel Cost	Income Level	Mode of Transport(Class)
Male	0	Cheap	Low	Bus
Male	1	Cheap	Medium	Bus
Female	1	Cheap	Medium	Train
Female	0	Cheap	Low	Bus
Male	1	Cheap	Medium	Bus
Male	0	Standard	Medium	Train
Female	1	Standard	Medium	Train
Female	1	Expensive	High	Car
Male	2	Expensive	Medium	Car
Female	2	Expensive	High	Car

MODULE -IV

7(a) Figure 1.1 shows the plot of a 2 class dataset . Discuss in detail,the algorithm which is suitable for the classification.

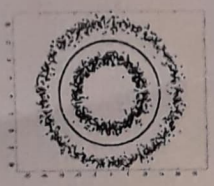

Figure 1.1

(b) What is Kernal Trick in Support Vector Machine? Give one example for a kernal function.

8(a) A neuron with 4 inputs has the weights 1, 2, 3, 4 and bias 0. The activation function is linear,say the function f (x) = 2x. If the inputs are 4, 8, 5, 6, compute the output. Draw a diagram representing the neuron.

(b) What is an activation function in an artificial neuron? Give some examples.

(2 x 5 = 10 Marks)

College of Engineering Trivandrum
Department of Computer Applications
Third Semester M.C.A Degree

Second Series Examination February-2022

20MCA203: Design and Analysis of Algorithms

Time :1 Hr

Max Marks :20

PART-A

(Answer all questions. Each question carries 2.5 marks)

1. What is the lower bound of the time complexity of comparison based sorting algorithms?Name any one technique used by lower bound theory for obtaining lower bounds.

2. Explain the control abstraction of branch and bound.

3. Distinguish deterministic and non deterministic algorithms with examples.

4. Define class P and NP.What is polynomial time reduction?

(Total: 4*2.5 =10 marks)

PART-B

(Each question carries 5 marks)

5. Explain the N-Queen's problem and its solution using backtracking

OR

6. Solve the following 8-puzzle problem using branch and bound.

1	2	3
8		4
7	6	5

Initial state

2	8	1
	4	3
7	6	5

Goal state

7. Show that the Clique problem is NP-complete

OR

8. Explain the Ford-Fulkerson algorithm.

(Total : 2*5 = 10 marks)