Register Number:……..

KUMARAGURU
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B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

U18AII4202: Neural Networks and Deep Learning

COURSE OUTCOMES

CO1: Understand different methodologies to create application using deep nets.
CO2: Design the test procedures to assess the efficacy of the developed model.
CO3: Identify and apply appropriate deep learning models for analyzing the data for a variety of problems.
CO4: Implement different deep learning algorithms.

Time: Three Hours **Maximum Marks: 100**

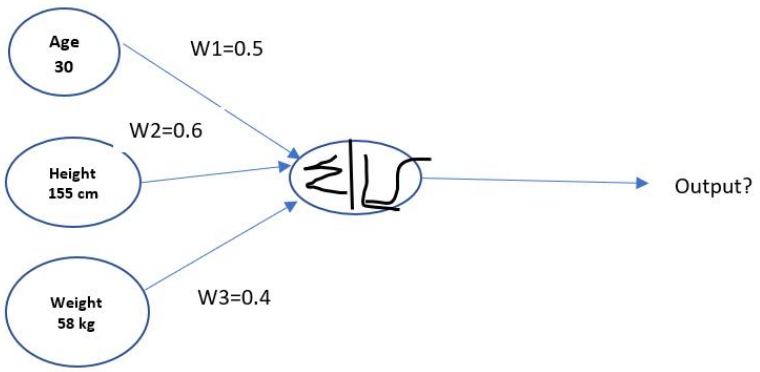
Answer all the Questions: -
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. Consider a 4 X 4 matrix as shown below: CO1 [K_3]

1	3	2	1
2	9	1	1
1	3	2	3
5	6	1	2

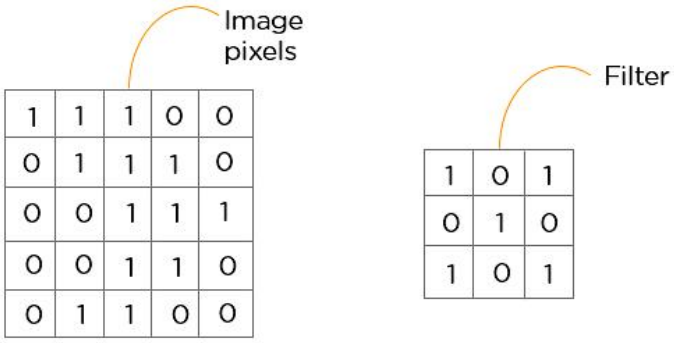
Applying max pooling on this matrix with stride = 2 to result in a 2 X 2 output.

2. List the popular CNN architectures. CO1 [K_1]
3. Outline the role of forget gate in LSTM. CO2 [K_2]
4. Discuss the need for Recurrent Neural Network. CO2 [K_2]
5. List the different types of Computer vision. CO3 [K_1]
6. Compare the backpropagation algorithm and the Backpropagation Through Time algorithm? CO3 [K_2]
7. Calculate the output for the following neuron. CO3 [K_3]



8.	Summarize the advantages of Multi Task Learning.		CO4	[K2]
9.	Interpret cost function and gradient descent.		CO4	[K2]
10.	Explain the assumptions in Semi supervised learning.		CO4	[K2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	The following are the matrix representations of an image and a filter.  a. Slide the filter matrix over the image with one stride and compute the convolved feature matrix. (5 marks) b. Reduce the dimensionality of feature map by applying maxpool, 2 X2 filter and stride=2. (4 marks) c. Flatten the pooled feature map. (1 mark)	10	CO1	[K3]
	b)	Implement in python to build a Convolutional Neural Network with a fully connected layer for classifying ten targets.	6	CO1	[K3]
12.	a)	Explain the need for Recurrent Neural Networks.	6	CO2	[K2]
	b)	Explain how Natural Language Processing Function in Artificial Intelligence?	10	CO2	[K2]
13.		Illustrate the key differences between Standard Neural Network and Bayesian Neural Network and summarize the advantages and limitations of Bayesian Neural Network.	16	CO3	[K3]
14.	a)	Apply Non-saturating Activation Functions to fix the vanishing/exploding gradients problems and discuss in detail.	10	CO3	[K3]
	b)	Outline the architecture of autoencoders.	6	CO3	[K2]
15.		Develop a plan in Training and Prediction of Generative Adversarial Networks (GANs).	16	CO4	[K3]
16.	a)	Explain how weights are updated in backpropagation?	10	CO4	[K2]
	b)	Explain how Data Augmentation serves as a regularizer and Data Generator.	6	CO4	[K2]

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