National University of Computer and Emerging Sciences, Lahore Campus

Course:	Artificial Intelligence		**Course Code:**	AI2002
Program:	BS(Computer Science)		**Semester:**	Spring 2024
Duration:	30 minutes		**Total Marks:**	15
Date:	12-05-24		**Weight**	3.33%
Section:	M		**Page(s):**	
Quiz:	5			

Instruction:
- **Understanding the question is also part of the quiz, so do not ask for any clarification. Make suitable ASSUMPTIONS in case of any issues.**
- **No leniency on plagiarism.**
- **Multiple selections or cutting will result in zero marks.**

Section A: (2+2+2+3+3+3)

1. **What is the purpose of using ReLU (Rectified Linear Unit) activation function in CNNs? Explain why we don't use any other activation function.**

    A. To introduce non-linearity to the model

    B. To normalize the input data

    C. To reduce the dimensionality of feature maps

    D. To initialize the weights of the network

2. **What is the purpose of using data augmentation during CNN training? Write some examples how can we increase sample size of dataset.**

    A. To increase the number of trainable parameters

    B. To speed up the convergence of the model

    C. To generate additional training data from existing samples

    D. To reduce the depth of the feature maps

3. **If an input image size is 12x12 pixels and one layer of padding is applied to maintain the output image size as 12x12 pixels after convolution, what would be the stride size used for the convolution operation? Show computations when dimensions of filter matrix are 2 by 2.**

    A. 1

    B. 2

    C. 3

    D. 4

    E. Any other

4. **If a 1024×1024 image is convolved with 4 3×3 filters using a stride size of 6, what will be the dimensions of the resultant matrix (feature map)? Assuming p=0.**

5. **If a 128×128 image is convolved with 20 4*4 filters using a stride size of 3, what will be the dimensions of the resultant matrix (feature map)? Assuming p=2**

6. **What will be the dimensions of above resultant matrix if p=0?**