Manarat International University (MIU)

Department of Computer Science and Engineering
Final Examination (Fall 2019)
Computer Vision and Robotics (CSE-437)

Full Marks: 40 Time: 2.5 Hour

Answer any 8 (Eight) questions. All questions are of equal value.

1	a. Why the state-of-the-art practice for having non-linearity is to use **rectified linear units** (ReLU) instead of **sigmoid** function in deep neural network? What are the disadvantages of using sigmoid?	4
	b. Explain **Maxout Neuron**.	1
2	a. What is the best way to initialize the weights of a neural network ?	3
.	b. What problems do **non zero-centered** activation functions causes during back propagation of a neural network.	2
3	a. What is a **saddle point**. Why does **SGD with momentum** escape from a saddle while vanilla SGD does not ?	3
	b. Why does **second order** optimization method impractical for training neural network?	2
4	a. Why do we need **zero-mean** and **unit-variance** activations in a deep neural network. Write a technique to achieve this.	3
	b. How to implement **Dropout** at test time.	2
5	a. Write the major differences between **Fast R-CNN** and **R-CNN**.	3
	b. Draw the blog diagram of the **Mask R-CNN** algorithm**.**	2
6	a. Explain the **Region Proposal Network** (RPN) network in Faster R-CNN algorithm.	3
	b. Explain **Sliding Window** approach for semantic segmentation.	2
7	a. Explain the core intuition of the residual block in **ResNet** architecture.	3
	b. Write a short note about **AlexNet** architecture and it's implementation procedure.	2
8	a. What is an **Inception Module**? What is the problem with this and what is the solution ?	3
	b. Why do smaller **kernel size** in a CNN layer is preferable ?	2
9	a. Why do auxiliary classifiers are added in **GoogleNet** ?	3
	b. Compare the **computational complexity** among different top CNN architectures of ILSVRC.	2