University	:	*Menoufia*		*Date*	: *13/06/2019*
Faculty	:	*Electronic Engineering*		*Time*	: *3 Hours*
Department	:	Computer Science and Eng.		*No. of pages*	: *1*
Academic level	:	*3th Year*		*Full Mark*	: *70 Marks*
Course Name	:	Selected topic 3		*Exam*	: *Final exam*
Course Code	:	CSE 326		*Examiner*	: *Dr.Marwa Shouman*

Question No. 1 **(30 Marks)**

a) Demonstrate single layer network learning of the binary logic function AND. Assume that W_1=0.3, W_2= - 0.1, Threshold= 0.2, Learning rate 0.1
b) What is the types of data analytics? define each type .
c) Define support vector machine? what is the relation between support vectors and the margin ?
d) What is Gini index? What is the different types of distance in measuring similarity? write equations
e) What Is R-squared?
f) What is the difference between linear regression and logistic regression? Describe each algorithm with equations .

Question No. 2 **(25 Marks)**

a) Define Multi-layer neural network.
b) Describe the steps of The back-propagation training algorithm with equations .
c) What is the difference between machine learning and traditional programming?
d) Five randomly selected students took a math aptitude test before they began their Mathematics course. What is the linear regression equation?

Student	x_i	y_i
1	95	85
2	85	95
3	80	70
4	70	65
5	60	70

Question No. 3 **(15 Marks)**

a) Write the python code to create a model to predict that if a customer will purchase a product or not by using SVM algorithm, and the dataset called:Social_Network_Ads.csv. [hint: SVC] exist in sklearn.svm.The EstimatedSalary range is very high with respect to Age, how you treat that in the code?

User ID	Gender	Age	EstimatedSalary	Purchased

b) Write the python code to build the artificial neural network consist of (input/ one hidden /output) layers.
(Hint: the number of features equal 11, and one output)