1.) On performing Grid Search with 5 folds on the given dataset, the best accuracy using Radial Bias kernel is 0.944 - 0.972,i.e, 94.4% - 97.2%.

2.) i) Linear - 100%
Radial Bias - 93.10%
Sigmoid - 72.41%
Polynomial - 82.76%

Neural Network - 89.66%

Classification Report For All Kernels in SVM:

linear :

	precision	recall	f1-score	support
1	1.00	1.00	1.00	12
2	1.00	1.00	1.00	6
3	1.00	1.00	1.00	1
4	1.00	1.00	1.00	4
5	1.00	1.00	1.00	1
6	1.00	1.00	1.00	2
7	1.00	1.00	1.00	3
micro avg	1.00	1.00	1.00	29
macro avg	1.00	1.00	1.00	29
weighted avg	1.00	1.00	1.00	29

Score: 1.0
rbf :

	precision	recall	f1-score	support
1	0.92	1.00	0.96	12
2	1.00	1.00	1.00	6
3	0.00	0.00	0.00	1
4	0.80	1.00	0.89	4
5	0.00	0.00	0.00	1
6	1.00	1.00	1.00	2
7	1.00	1.00	1.00	3
micro avg	0.93	0.93	0.93	29
macro avg	0.67	0.71	0.69	29
weighted avg	0.87	0.93	0.90	29

Score: 0.9310344827586207
sigmoid :

	precision	recall	f1-score	support
1	0.79	0.92	0.85	12
2	0.67	1.00	0.80	6
3	0.00	0.00	0.00	1

4	0.67	1.00	0.80	4
5	0.00	0.00	0.00	1
6	0.00	0.00	0.00	2
7	0.00	0.00	0.00	3
micro avg	0.72	0.72	0.72	29
macro avg	0.30	0.42	0.35	29
weighted avg	0.56	0.72	0.63	29

Score: 0.7241379310344828
poly :

	precision	recall	f1-score	support
1	1.00	0.83	0.91	12
2	1.00	1.00	1.00	6
3	0.00	0.00	0.00	1
4	0.50	1.00	0.67	4
5	1.00	1.00	1.00	1
6	1.00	1.00	1.00	2
7	1.00	0.67	0.80	3
micro avg	0.86	0.86	0.86	29
macro avg	0.79	0.79	0.77	29
weighted avg	0.90	0.86	0.86	29

Score: 0.8620689655172413

3.) Using SVM classifier, we performed a grid search on the given dataset with 5 fold cross validation.
    The best accuracy was obtained using Radial Bias kernel with C=10 and gamma=0.1.
    The accuracy obtained was 0.9722.
    Average precision and recall for all classes is 1.0

4.) There is no noise in our precision-recall curve.
    The trends in the graph show that our classifier approaches towards perfection.