FOML Assignment-2

Q4:
4(a) Accuracy- 98.11320754716981 support vectors 120
(Used SVC classifier for fitting data and C_ value =0.01 )

4(b)
No of samples- 50 Accuracy- 97.16981132075472 support vectors 24
No of samples- 100 Accuracy- 98.11320754716981 support vectors 36
No of samples- 200 Accuracy- 98.11320754716981 support vectors 48
No of samples- 800 Accuracy- 98.34905660377359 support vectors 90

4(c)
(i) FALSE
(ii)TRUE
(iii)FALSE
(iv)TRUE

4(d)
Lowest training error is for c=1000000
Lowest test error for c=100

c= 0.01 training_error= 0.0038436899423446302 test error= 0.02358490566037741
c= 1 training_error= 0.004484304932735439 test error= 0.021226415094339646
c= 100 training_error= 0.0032030749519538215 test error= 0.018867924528301883
c= 10000 training_error= 0.002562459961563124 test error= 0.02358490566037741
c= 1000000 training_error= 0.0006406149903908087 test error= 0.02358490566037741

Q5:
5(a)
Linear kernel: training_error= 0.0, test_error =0.02400000000000002, support vectors= 1084

5(b)
RBF kernel: training_error= 0.0 test error= 0.5 , support vectors= 6000
Polynomial kernel:
training_error= 0.0004999999999999449, test error= 0.020000000000000018, support vectors= 1332

RBF kernel yields the lowest training error.