Part b)

Batch 1:

T = 0.25; K = 65; sig = 0.30; r = 0.08; S = 60 (then C = 2.13293, P = 5.84584)

I decided to give a meaningful time step instead of giving values of order 100. I gave number of subinterval value to 25 which discretizes total T (0.25) in to 0.01 steps. It produces better results in this case.

Number of subintervals in time: 25

Number of simulations: 100000

P after discounting: 5.84675

C after discounting: 2.13011

Number of subintervals in time: 250

Number of simulations: 100000

P after discounting: 5.91394

C after discounting: 2.09233

Batch 2:

T = 1.0; K = 100; sig = 0.2; r = 0.0; S = 100 (then C = 7.96632, P = 7.96632)

Here again I gave subinterval value to 100 which discretizes total T (1.0) in to 0.01 steps. It produces better results.

Number of subintervals in time: 100

Number of simulations: 50 000

P after discounting: 7.99906

C after discounting: 7.95195

Number of subintervals in time: 100

Number of simulations: 100000

P after discounting: 7.99841

C after discounting: 7.90362

Number of subintervals in time: 200

Number of simulations: 500 000

P after discounting: 8.00531

C after discounting: 7.92294

Part c)

Batch 4.

T = 30.0; K = 100; sig = 0.30; r = 0.08; S = 100 (then C = 92.1749, P = 1.24651)

Number of subintervals in time: 300; Number of simulations: 200000

C after discounting: 90.7364 P after discounting: 1.27195

Number of subintervals in time: 600; Number of simulations: 100000

C after discounting: 91.398 P after discounting: 1.26879

Number of subintervals in time: 600; Number of simulations: 200000

C after discounting: 92.0678 P after discounting: 1.25913

Number of subintervals in time: 600; Number of simulations: 300000

C after discounting: 91.4957 P after discounting: 1.2591

Number of subintervals in time: 600; Number of simulations: 500000

C after discounting: 91.6771 P after discounting: 1.25259

Number of subintervals in time: 900; Number of simulations: 200000

C after discounting: 92.293 P after discounting: 1.25966

Number of subintervals in time: 900; Number of simulations: 300000

C after discounting: 92.0166 P after discounting: 1.25294

Number of subintervals in time: 900; Number of simulations: 10 00 000

C after discounting: 91.6221 P after discounting: 1.24984

Number of subintervals in time 3000; Number of simulations: 100 000

C after discounting: 90.8074 P after discounting: 1.24864

Number of subintervals in time 300; Number of simulations: 10 00 000

C after discounting: 91.3045 P after discounting: 1.26099

Number of subintervals in time 600; Number of simulations: 15 00 000

C after discounting: 91.8184 P after discounting: 1.25428