25. (1.5 points)

The following information is available for a retrospectively rated policy:

Standard premium	**$20,000**
Guaranteed cost premium	**$19,760**
Provisions for losses and expenses exclusive of taxes	**$19,160**
Expected losses	**$12,000**
Loss conversion factor	**1.250**
Tax multiplier	**1.025**
Selected maximum loss ratio	**95%**
Selected minimum loss ratio	**20%**
Charge for maximum	**0.055**
Charge for minimum	**0.700**

Calculate the maximum premium ratio for this policy.

END OF EXAMINATION

Question 25

Sample 1

$X_H - X_G = (e+E-H/T)/cE$
$0.7 - 0.055 = (19,160/20,000 - H/1.025)/1.25*0.6$
$H = 0.4861$
$r_G = 0.95/0.6 = 1.583$
$r_H = 0.2/0.6 = 0.333$
$r_G - r_H = (G-H)/cET$
$1.583 - 0.333 = (G - 0.4861)/1.25*1.025*0.6$
$G = 1.447$

Sample 2

$\Psi(r_H) = 0.7 + 0.2/0.6 - 1 = 0.033$
$GCP = T(e+E)$
$19,760/20,000 = 0.988 = 1.025(e+0.6)$
$e = 0.3639$
$E = 12/20 = 0.6$
$I = 0.6(0.055 - 0.033) = 0.013$
$b = e - (c-1)E + cI = 0.3639 - 0.25(0.6) + 1.25(0.013) = 0.2302$
$G = (b+cr_GE)T$
$r_G = 0.95/0.6 = 1.583$
$G = (0.2302 + 1.25*1.583*0.6)*1.025 = 1.4531$

Sample 3

$GCP = 19,760 = (e+E)T$
$e+E = 19,160$
$E = 12,000$
$e = 7,160$
$T = 19,760/19,160 = 1.0313$
$B = e - (c-1)E + cI$
$cI = c(X_G - S_H)E$
$b = 7,160 - 0.25*12,000+1.25(0.055 - 0.0333)*12,000 = 4,485$
$X_G = 0.055$
$X_H = 0.700$
$S_H = X_H+r_H-1 = 0.7+1/3-1 = 0.03333$
$r_H = L_H/L = 0.2*SP/12,000 = 4,000/12,000 = 1/3$
$G = (b+L_Gc)T = (4485+19,000*1.25)*1.0313 = 29,119$
$L_G = 0.95*SP = 19,000$
G ratio = $29,119/SP = 1.456$