1. Discuss the stability and degree of indeterminancy of the following 3 plane structures (15%)

(a) 

(b) 

(c) 

2. Given a compound beam shown in the following figure, construct the influence lines for reactions $R_c$, $R_E$, shear $V_B$, and moment $M_B$. (15%)

3. Please draw the moment and shear diagrams of the beam shown in the following figure using consistent deformation method (no score using other method). This beam have the same $EI = 30 \times 10^6$ in$^2$, $w = 2 \text{kips/ft}$, $k_s = 10 \text{kips/ft}$, $p = 20 \text{kips}$. (15%)
4. Find the member forces in members BH, HG and AB of the truss shown in the following figure using consistent deformation method (no score using other method). All member have the same \( AE = 30000 \text{ kips} \). (20%)

Temperature rise: 50° F

5. For the following frame, please (1) determine the degree of indeterminacy and degree of freedoms of the frame (neglecting axial deformation); (2) analyze the given frame by the slope-deflection method (no score using other method) and draw the corresponding shear and moment diagrams. Note that, \( EI = \text{constant} \). (15%)

\[ k_s = 20 \text{ kips/in} \]

2 @ 24 ft = 48 ft
6. Determine the member-end moments for the given frame by the moment distribution method (no score using other method) and calculate the horizontal deflection of point B. Note: $E = 30,000$ kips/in$^2$. (20%)