A. Figure 1 plots out the supply and demand equations with technology rating \((T)\) of 2 and workings condition value \((C)\) of 4. Equilibrium occurs at wage of 56 and hours equal to 50.

B. If the technology index rises from \(T=2\) to \(T=5.68\), the demand curve shifts outward. The supply curve remains as it was in section A. As the demand shifts outward, the wage is bid upward and workers from other sectors switch into this market, a movement up the supply curve. The new equilibrium is illustrated in Figure 2. Equilibrium occurs at wage of 62.58 and hours equal to 55.

C. If instead, the demand curve stays the same as in section A but working conditions rise from 4 to 12.82, the supply curve shifts out. The equilibrium wage falls as the number of hours offered increase. Equilibrium occurs at wage of 51.55 and hours equal to 55.

D. Return to Figure 1. Now a union bids up the wage to $69.50. Supply and demand curves remain the same, but at the higher wage, hours demanded fall to 35 while hours supplied rise to 60. Unemployed hours rise from zero at equilibrium to 60-35 = 25 hours when the wage is fixed at $69.50. The unemployment rate for hours is 100*(25/60) = 41.67%

Figure 1: Equilibrium supply and demand with technology index = 2 and working conditions =4. Union solution from part D is also illustrated.
Figure 2: Equilibrium supply and demand with technology index = 5.68 and working conditions = 4.

Figure 3: Equilibrium supply and demand with technology index = 2 and working conditions = 12.82.