Instructions: Answer 3 of the following 5 questions. Provide diagrams and explain your answers. Fuller answers get better grades but irrelevant waffle will be penalized.

(1) Briefly describe the experiment used by some researchers to identify the employment effects of the minimum wage increase in New Jersey in 1992. Explain how their results appeared to contradict the conventional wisdom at that time (based on minimum wage increases during the 1970's). Explain how the two sets of results can be reconciled within the same model of the labor market.

(2) Explain how ability bias and selectivity bias can each affect the measurement of returns to education? Describe a statistical approach that has been used to address either source of bias.

(3) Suppose the market for mortgage brokers in the United States is summarized as follows:

Supply: \( w = 600 + 0.001E \)

Demand: \( w = 1200 - 0.0005E \)

where \( w \) is the weekly wage in dollars and \( E \) is the number of brokers.

(i) What are the competitive equilibrium wage, \( w^* \) and employment level, \( E^* \)?

(ii) Suppose that the President needs to pay for new regulations on mis-selling of mortgages and he decides to do it by imposing a $60 payroll tax on the employment of mortgage brokers. The tax is levied equally
on brokers and the banks that employ them ($30 each). What is the new employment level and wage rate for mortgage brokers in the country? How much of the tax do the brokers and the banks end-up paying (compared to before the taxes were brought in)?

(iii) How does the amount of tax each side of the market actually pays depend on how the tax is levied?

(iv) A proposal by President Obama (in consultation with congressional Republicans) is to reduce the workers’ share of payroll taxes. Some have criticized this because it does not target job creation. The critics would prefer that the employer’s receive the tax break. Given your answers to parts (ii) and (iii) comment on the wisdom of these critics.

(4) Answer parts (a) and (b)

(a) Describe 3 features of the recent changes in the US wage structure that a complete theory should be able to simultaneously explain?

(b) Discuss 3 theories that have been put forward to explain these features. To what extent has each theory been successful.

(5) One hundred people work at a mining site. There are 2 types of jobs: surface jobs and underground jobs. Jobs on the surface are perfectly safe and pay $400 per week. Person $i$’s preferences for working under ground are given by the formula

$$U_i(w, d) = w - i \times 0.01 \times d$$

where $w$ is the wage, $d$ is the depth under ground in feet and $i$ is the person’s number (i.e. between 1 and 100). So the person with $i = 1$ is the least averse to working underground and, for example, for the fiftieth least averse to being underground:

$$U_{50}(w, d) = w - 50(0.01d) = w - 0.5d$$
(a) What do the indifference curves for the 50th person look like (use $w$ on vertical and $d$ on the horizontal axis)? Plot one each for $U = 200$, $300$, $400$ (use $d = 100$ and $200$ feet only). What wage would this person require to work $200$ feet below the ground?

(b) In general, for person $i$ what wage would they require to work $200$ feet below ground? (That is I want the wage as function of $i$.)

(c) Suppose the mine owner requires 60 people to work at a depth of $200$ feet how much would she have to pay the underground miners?

(d) If the installation of safety equipment that could make the underground jobs as safe as the above ground jobs costs $200$ per worker per week, would the owner be willing to pay for such equipment? How would your answer change if the mine was $400$ feet deep? Explain.