This examination has 5 questions and you are to do all five. Each question has the same value, and all parts of each question are weighted equally, so allocate your time accordingly.

1. The monocentric model has been used to explain the locations of various income groups in urban areas.
   
   a. Briefly sketch out (using a diagram) the monocentric model, in the presence of a low income and a high income group, indicating which group will locate further from the center of the city, and why.

   b. Suppose, one morning everyone wakes up and discovers that gasoline prices have doubled overnight. Remembering all of the components of transportation costs, what will the doubling of gasoline prices do to marginal transportation costs?

   c. What will be the long run impact of the doubling of the gasoline costs on the rents that people are willing to pay? What will be the long term impact of this change on household locations relative to the center of the city?
2. Suppose that a city has 3,000 black residents and 1,000 white residents. It has 4 neighborhoods that have the following racial configuration:

<table>
<thead>
<tr>
<th></th>
<th>Neighborhood</th>
<th>Black Residents</th>
<th>White Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>1000 B; 0W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N2</td>
<td>700 B; 300W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N3</td>
<td>700 B; 300W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N4</td>
<td>600 B; 400W</td>
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</tbody>
</table>

a. Recall the formula for the dissimilarity index: $D = \sum \frac{l_i |p_i - p^*|}{2Tp^* (1 - p^*)}$. What does the numerator refer to? What does the denominator refer to? What number would we use for $p^*$?

b. Calculate $D$ for the city.

c. What distinctions to economists make between segregation and discrimination?
3. Suppose that a consulting firm is engaged to estimate the economic impacts of moving the Tigers from Tiger Stadium to Comerica Park (the new stadium). The economic base study was based on the following assumptions:

i. Total attendance at Tigers games was 1,000,000 in 1999, and is expected to rise to 1,750,000 in 2000.
ii. The average ticket price will be $20.
iii. The average fan will spend an additional $15 on food, merchandise, and parking.
iv. Based on ii and iii, the average fan will spend a total of $35.
v. Total “direct” spending will be $61.25 million per year ($35 multiplied by 1,750,000)

a. Using a multiplier of 2.0, estimate the total economic impact of the Tigers per year. Estimate the incremental impact that might be attributed to the move.

b. What are the assumptions behind the multiplier analysis?

c. Critically appraise the methods used to compute the economic impact of the construction of Comerica Park on the Tigers’ improved attendance.
4. Consider a town called Robranna. Laborers and businesses are able to move in and out freely. Robranna exists within a system of cities such that in order for long run equilibrium to obtain, the following diagram holds.

![Graph showing Rents (R) vs. Wages (w)]

- **a.** Discuss why the two curves have the shapes that they do, and what the equilibrium values of \( R \) and wages \( w \) mean. Label these values on the graph.

- **b.** Suppose that water from the local river is found to have great medicinal powers, making everyone in the city better off because they can drink it. Businesses are not impacted by this development with respect to improving their productivity. Will the resident population be better off in the long run? Why or why not?

- **c.** What will happen to the size of the population and the size of the city in the long run. You may want to draw another diagram to illustrate this.
5. Consider a family that is living in Ferndale, a nearby suburb of Detroit. The family currently has an income of $50,000 and rents a little house for $10,000 per year. The income elasticity of demand for housing is +0.75.

a. If their income rises to $70,000, how much rent would they be willing to pay for a bigger house in Ferndale? Why?

b. What percentage of their income are they paying for housing services at the first location (little)? At the second location (big)? If the percentage changes, why? If not, why not?

c. Suppose the landlord offers to sell them the big house. If the market interest rate is 10% what is the market value of the big house?