Global Economy
Midterm Test: SOLUTIONS

1. The growth rate of real GDP is approximately equal to the sum of the growth rate in nominal GDP plus a measure of the growth rate of average prices (ie, inflation).

False. Nominal GDP is the product of a quantity index (ie, real GDP) and a price index (ie, average prices). Therefore, the rate of change over time in nominal GDP is approximately equal to the rate of change of real GDP plus the rate of change in average prices, ie, inflation. In other words, the growth rate of real GDP is approximately equal to the growth rate of nominal GDP ***minus*** the inflation rate.

2. The expenditure method of measuring GDP provides a downwardly biased estimate of national income when aggregate savings is positive, since savings is part of income but not part of expenditures.

False. GDP is a measure of total value added. It is an estimate of income because value created must flow to the owners of the factors of production, capital and labor, that created that value, hence would be reported as income. The expenditure accounts describe how what that income is used to purchase. The fact that part of the income earned is saved simply reflects is use by firms as investment (or perhaps international firms through net exports), which does not affect the relationship between GDP and income.

3. If the value of imported goods and services could be netted out of expenditures on consumption, investment and government purchases, then GDP would simply be the sum of those three net expenditures.

False. GDP can be no smaller than the sum of those three net expenditures, but if part of the value created in an economy is exported, then GDP must reflect that as well. That is, GDP≥C+I+G-M, whereas GDP=C+I+G+X-M.

4. For an economy that employs the Cobb-Douglas production technology, $Y=AK^{1/2}L^{1/2}$ (the exponent is1/2 not 1/3 -- this is not a typo), if we see capital per worker grow from 4 to 16, then output per worker must double over the same period.

False. The production function implies $(Y/L)=A(K/L)^{1/2}$. When K/L grows from 4 to 16, $(K/L)^{1/2}$ grows from $4^{1/2}=2$ to $16^{1/2}=4$, ie, it doubles. However, we don't don't know what is happening to A while K/L is changing, we have no idea how Y/L is changing. That is, if A is constant, then Y/L doubles, but if A falls by ½, then Y/L would stay constant.

5. If total factor productivity is constant over time, but capital per worker falls, then Cobb-Douglas production function implies that standards of living measured by output per capita must also fall.

False. Output per capita, Y/Pop, is equal to (Y/L)(L/Pop). If Y/L falls because K/L falls, we will not know what happens to Y/Pop unless we also know what happens to labor

participation, L/Pop. For example, L/Pop could increase more than the decrease in Y/L, hence Y/Pop could actually increase.

6. Diminishing marginal productivity of capital and labor dictates that growth in aggregate output driven by continual improvements in TFP will eventually slow down and ultimately converge to a long-run with zero growth.

False. TFP is a factor that scales the contributions to output of capital and labor. If it is growing continuously, then it doesn't matter what happens to the marginal products of K and L, output will continue to grow. That is, a production function Y=A F(K,L) has no diminishing marginal productivity in A, hence perpetual increases in A will result in perpetual increases in Y.

7. An increase in productivity is bad for employment since firms don't need as many workers to achieve the same levels of output.

False. The goal of a firm is not to keep the level of output fixed and hire the amount of labor that will produce that output. Rather the goal of the firm is to maximize value added (eg, profits). The firm, therefore, will hire labor to the point where the marginal product of labor equals the wage rate. For a given wage, an increase in productivity will induce the firms to increase, not decrease, employment until diminishing marginal productivity restores equality between marginal product and the wage.

8. Total factor productivity (TFP) is strictly a technological factor that has little or nothing to do with economic institutions.

False. Economic institutions such as the legal and regulatory environment, the tax system, corporate governance and investor protection, the cost of settling constracts, etc, have a substantial effect on both the efficient operations of a firm, and on an economy's ability to allocate capital and labor resources to their highest value uses. Since productivity is measured as a residual after the contributions of capital and labor inputs are taken into account, any change in economic institutions will appear as a change in TFP.

9. A free trade accord with the US benefits Mexican workers only if it results in an increase in their wages.

False. After a trade liberalization, all prices could change, not just wages. If the efficiency gains from free trade induced large reductions in the prices of goods, the purchasing power of Mexican households could be greater, and hence standards of living could be higher, even if Mexican wages fell.

10. Free trade can raise TFP in one country only if it lowers it in another.

False. Since free trade induces firms in both countries to produce more efficiently, the same aggregate resources, eg, capital and labor, will be reallocated to higher value uses in both countries. Therefore, since both countries will create more aggregate value added while using the same resources, TFP in both countries will go up.