Multiple Choice
1) b  2) d  3) d  4) c  5) c  6) a  7) d  8) b  9) c  10) c

Problem 1: IS/LM

a) A rise in money supply will force the interest rate down to maintain equilibrium in the money market – to raise money demand to equal the higher money supply. A fall in \( r \) for a given \( Y \) is a downward or rightward shift in the LM curve.

b) \( Y \) rises, \( r \) falls, \( I \) rises, \( C \) rises, national saving rises (we know that saving equals investment in equilibrium).

c) When money supply rises, the interest rate would need to fall less to raise money demand and equilibrate the money market. So \( Y \) rises less, \( r \) falls less, and \( I \) rises less.

d) If investment were a positive function of income, than as \( Y \) rises, it would lead to further rises in \( I \). This would raise demand and \( Y \) even more. In other words, the IS curve would be flatter. Money demand would rise more due the greater rise in \( Y \), so the interest rate rises less and still can clear the money market. So \( Y \) rises more, \( r \) falls less, \( I \) rises more.

Problem 2: Growth:

a) Steady state condition: \( s f(k) = (\delta+n)k \), \( s = \frac{A}{(\delta+n)} \), \( k^{1/2} = \frac{A}{(\delta+n)} \),
so \( k^* = (\frac{A}{(\delta+n)})^2 = (6/0.10 \cdot 0.04 + 0.06)^2 = (0.6/0.1)^2 = 36. \)
Steady state growth rate in \( K \) is population growth rate: \( n = 0.04. \)
Golden rule condition: \( MPK = (\delta+n), \frac{1}{2}Ak^{1/2} = (\delta+n), \) so \( k*_{\text{gold}} = (A/(2(\delta+n)))^2 = (6/(2.1)) \)
\( = 900. \)

b) Under lower population growth: \( k^* \) higher, \( K \) growth lower, \( k*_{\text{gold}} \) higher

c) Under lower saving rate: \( k^* \) lower, \( K \) same, \( k*_{\text{gold}} \) same
Problem 3: Short Run and Long Run

The fall in consumption lowers total expenditure and output for a given level of interest rate and price level. This is a leftward shift in the IS curve and AD curve. In the long run, the price falls and raises the real money supply. This requires a rise in Y or a fall in r to maintain equilibrium in the money market. This is a rightward shift in the LM curve.

b) Short run: Y falls, r falls, I rises.

c) Long run: Y at initial level, r lower, I higher, P lower, M/P is higher.

d) In brief, the long run result here is identical to the neoclassical model. Once prices adjust and markets clear, the interest rate has fallen enough, so that the rise in investment demand exactly compensates for the fall in consumption demand.

Problem 4: Consumption Theory

a) The intertemporal budget constraint is:

\[ C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r} \]
\[ 30 + \frac{30}{1+r} = 60 + \frac{0}{1+r} \]
\[ \frac{30}{1+r} = 30 \]
\[ r = 0 \]

b) Given that your income in period 1 exceeds your consumption, you are a saver. So the rise in the interest rate makes you better off, and has the following effects on consumption:

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall</td>
<td>rise</td>
<td></td>
</tr>
<tr>
<td>rise</td>
<td>rise</td>
<td></td>
</tr>
<tr>
<td>ambiguous</td>
<td>rise</td>
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</tr>
</tbody>
</table>

since saving is Y1-C1, it too is ambiguous.

So: C1 ambiguous, saving ambiguous, C2 rise.

c) The consumption puzzle is the fact that in long-run data it appears that the average propensity to consume (C/Y) is constant, but that it falls for short-run changes in income. (Another way of putting this, is that the MPC is high and near unity for permanent changes in income, but lower for temporary changes in income.) The model here can explain this, since if income were to rise only in period 1, only about half would be consumed in the current period and the remaining half would be saved. But if income goes up both periods by some amount, current consumption would go up by the full amount.