Regrade policy: If you would like your test regraded, please submit a written statement to explain why. Your entire test will be regraded, so there is a possibility that points could be lost rather than gained.

Multiple Choice:

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

Problem 1: Neoclassical Model

a) \( Y^s = 5x10 + 3x10 = Y = 80 \).
\( Y^d = C + I + G = [10 + 0.75(80-20)] + [30 - 100r] + 15 \)
setting \( Y^s = Y^d \), \( 80 = 100 - 100r \)
so \(-20 = -100r \) so \( r = 0.20 \) or 20%  
I = 30 - 100r = 30 - 100(0.20)  
C = 10 + 0.75(80-20)  
So sp = Y – T – C = 80 – 20 – 55  
sg = T – G = 20 – 15  
S = Y – C – G = 80 – 55 – 15

The key equilibrium condition in the goods/financial are supply of goods equals demand: \( Y = C+I+G \). This can also be written as saving =investment, from the perspective of the financial market. The interest rate adjusts so that the demand for loanable funds (for investment) in the financial market equals the supply (saving).

b) A rise in G lowers government saving and hence national saving. This raises the equilibrium real interest rate to maintain equilibrium in the financial market. This works by lowering investment to a level consistent with the lower supply of savings in the economy. There is no impact on the level of production here, since this is determined by the supply of capital and labor in the economy. Private saving is unaffected, since there is no change in Y, T or C. (c, b, a, b, c)

d) A rise in labor causes a rise in the level of production. This raises national saving, lowers the real interest rate and encourages more investment. Since income is higher, there is more consumption and private saving both. (a, a, b, a, a)

Problem 2: Neoclassical Model of Unemployment

a) \( W/P = MPL = (K/L)^{1/2} = (100/100)^{1/2} = 1 \)

b) set minimum wage = MPL, \( 2 = (100/L)^{1/2} \) and solve for L
\( 4 = 100/L, \) so \( L = 100/4 = 25 \).
So unemployment is 100 – 25 = 75, and the unemployment rate is 75/100 = 75%.
Yes the minimum wage in this case creates unemployment.

c) A higher capital stock raises the marginal product of labor, which would raise the market clearing real wage. This means the firm can hire more workers at the high minimum wage and still be profitable. This should lower the unemployment rate (a, b)
Problem 3: Solow Growth Theory

a) steady state: \( s f(k^*) = (\delta + n) k^* \)
\[
0.20 \times 2k^{1/2} = 0.10k^* \\
2k^{1/2} = 0.5k^* \\
k^{1/2} = 4 \quad \text{so} \; k^* = 16 \quad \text{capital per person is 16 in steady state} \\
y^* = 2k^{1/2} = 2 \times 4 \quad \text{so GDP = 8 in steady state.} \\
c^* = (1-s)y^* = 0.80 \times 8 \quad \text{so consumption = 6.4 in steady state.}
\]

b) Use the golden rule condition:
\[
MPK = \delta + n \\
k^{1/2} = 0.10 \\
k^* = 10 \\
k^\text{gold} = 100 \\
\text{More capital requires a higher saving rate to achieve as a steady state.}
\]

c) With a lower population growth rate the economy will have a new steady state, one with a higher level of income and consumption per person. The golden rule condition tells us that the MPK will be lower, which implies a larger level of capital in the golden rule steady state. The steady state is still characterized by zero growth in per person terms, so this remains at the level 0. (a, a, a, c)

d) A higher saving rate means there is more investment, which can sustain a larger capital stock in steady state. This generates more income and potentially more consumption, raising the standard of living. The U.S. has a very low saving rate, indicating our steady state standard of living is well below the maximum level, by the golden rule. It is possible that a very high saving rate could lower consumption: even though the level of capital and output are higher, the share left over for consumption after replacing worn out machines each year could be smaller.