Multiple Choice: Choose the best answer. (60 points total, 3 points each)

1) In the national income accounts, investment includes all of the following except:
   a) Businesses purchasing new equipment.
   b) Stores increasing inventories in preparation for the Christmas rush.
   c) Households building new houses.
   d) Households purchasing stocks in a company.

2) The consumer price index (CPI):
   a) tends to understate inflation.
   b) suffers from substitution bias.
   c) has weights that change each year.
   d) all of the above

3) Which of the following might explain why the natural rate of unemployment in Canada is higher than in the U.S.?
   a) More unionization in Canada.
   b) Higher Canadian unemployment benefits.
   c) Higher Canadian minimum wages.
   d) All of the above.

4) Which of the following could reduce frictional unemployment?
   a) Introduce efficiency wages.
   b) Fund worker retraining programs.
   c) Lower minimum wages.
   d) All of the above.

5) Stagflation, a recession combined with high inflation, may be caused by:
   a) a rise in money supply.
   b) a shock that raises consumer demand.
   c) a shock that raises costs of production.
   d) a rise in government purchases.

6) Which of the following guarantees we are at a steady state in the Solow growth model?
   a) The depreciation rate equals the marginal product of capital.
   b) The saving rate equals the depreciation rate.
   c) Total saving equals investment.
   d) Investment equals total depreciation.

7) According to the Solow growth model, a high population growth rate will tend to:
   a) Lower the steady state growth rate in the total level of output.
   b) Raise the steady state growth rate in output per person.
   c) Lower the optimal level of output per person.
   d) Raise the steady state level of output per person.

8) The endogenous growth model of \( y = Ak \) implies
   a) the marginal product of capital is constant.
   b) the growth rate of \( y \) is constant.
   c) the growth rate of \( k \) is constant.
   d) all of the above

9) Which of the following is not implied by the quantity theory of money?
   a) Inflation equals the rate of money growth if output is constant.
   b) If both money supply and output double, price level will not change.
   c) Transactions velocity is price level multiplied by transactions divided by money.
   d) If money supply rises while prices are sticky, then velocity falls.

10) The Fisher relation says that higher expected inflation will:
    a) raise the ex ante real interest rate.
    b) lower the ex ante real interest rate.
    c) raise the nominal interest rate.
d) lower the ex-post real interest rate.

11) The classical Dichotomy
   a) says changes in real variables do not affect nominal variables
   b) says changes in nominal variables do not affect real variables
   c) holds mainly in the short run
   d) all of the above

12) Which of the following would tend to make the LM curve steeper:
   a) investment is more responsive to the interest rate
   b) money demand is more responsive to income
   c) money demand is more responsive to the interest rate
   d) none of the above

13) Which of the following would tend to make fiscal policy more effective in ending recessions:
   a) Investment is less responsive to the interest rate
   b) Money demand is more responsive to income
   c) Money demand is less responsive to the interest rate
   d) none of the above

14) In the neoclassical model of factors markets, a rise in the supply of capital will tend to
   a) raise the real rental rate on capital.
   b) lower the real wage.
   c) lower the real rental rate on capital.
   d) both a and b.

15) Which of the following theories of aggregate supply implies real wages rise when output rises:
   a) worker misperception model
   b) sticky price model
   c) imperfect information model
   d) none of the above

16) If the Phillips curve is \( \pi = \pi^e - 0.5 (u - u^n) \), and expectations are adaptive, then the
   sacrifice ratio is (in terms of output)
   a) 4
   b) 2
   c) 0.5
   d) 0

17) If the Phillips curve is \( \pi = \pi^e - 0.5 (u - u^n) \), and expectations are rational, then the
   sacrifice ratio is (in terms of output)
   a) 4
   b) 2
   c) 0.5
   d) 0

18) Which of the following could cause a trade deficit:
   a) high investment
   b) high private saving
   c) high government saving
   d) all of the above

19) The permanent income hypothesis of consumption says:
   a) the average propensity to consume rises with income in the short run
   b) the average propensity to consume rises with income in the long run
   c) the average propensity to consume falls with income in the short run
   d) the average propensity to consume falls with income in the long run

20) Which of the following could cause a fall in the level of net investment:
   a) A rise in the marginal product of capital.
   b) A fall in the relative purchase price of capital.
   c) A fall in the real interest rate.
   d) A rise in the depreciation rate.
**Problem 1: Neoclassical Economy** (20 points total, 10 points each part)

Suppose the supply side of the goods market of some country can be characterized as follows:

\[
Y = 9K^{1/2}L^{1/2} \quad \text{K} = 100 \quad \text{L} = 100
\]

Suppose the demand side can be characterized by the following:

\[
G = 200 \quad \text{T}=100
\]

\[
C = 100 + 0.5(Y-T) \quad I = 300 - 1000r
\]

a) Compute the equilibrium value of the following: consumption, government saving, total saving, real interest rate, real wage.

b) Suppose the government cuts taxes. State for each of the variables listed above whether it will rise, fall, not change, or if it is impossible to tell. (No computations necessary.) Explain briefly.

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**Problem 2: IS/LM in the Short Run** (30 points total, 10 points each part)

a) Suppose we are entering into a recession due to a shock that raises money demand. Using ISLM, show how this could lead to a recession. What would be happening to the following variables: interest rate, investment, and consumption.

(Note: make the usual assumptions unless stated otherwise: Prices are completely fixed in the short run and completely flexible in the long run. Consumption is a function only of disposable income, with a constant marginal propensity to consume. Investment is a function only of the interest rate.)

b) Suppose we combat this recession using fiscal policy. In particular, suppose government purchases are increased enough to restore output to its initial level. How would this affect the level of the variables listed in part (a)? In particular, for each variable state if it is equal to its initial value before the recession, higher, lower, or it is impossible to tell. Explain.

c) Suppose investment were a positive function of income as well as a negative function of the interest rate. Would the recession in part (a) be more or less severe? For each of the three variables analyzed in part (a), state if it moves more than in part (a), less, the same, or if it is impossible to tell. In 1-2 paragraphs, explain why the various components of investment might in reality be affected by the level of income.
Problem 3: Short Run and Long Run  (30 points total, 10 points each part)

Suppose that the Federal Reserve is going to cut the nominal money supply permanently. Use the IS-LM / AS-AD tools to analyze the implications in the short run and the long run. (Assume the following. Prices are completely fixed in the short run and completely flexible in the long run. Consumption is a function only of disposable income, with a constant marginal propensity to consume. Investment is a function only of the interest rate.)

a) Use the IS-LM and AS-AD graphs to show the short run and long run equilibria following this policy. Assume that prices are completely fixed in the short run. Be sure to label the axes, curves, use arrows to show shifts in curves, and mark the equilibrium points: 1 for the initial equilibrium, 2 for the short run equilibrium, and 3 for the long-run equilibrium. Explain briefly why the curves are shifting.

b) What happens to the following variables in the short run (rise, fall, no change, can’t tell): output, interest rate, investment, consumption, and price level.

c) What happens in the long run? For each of the variables listed in (b) above, state if it returns in the long run to its initial equilibrium value (point 1 on your graphs), if it is higher in the long run than its initial level, or if it is lower. Explain briefly.

Problem 4: Consumption Theory  (20 points total, 10 points each part)

Suppose you are a student that lives by the 2-period Fisher model of consumption. You are a student in year 1 and earn only $10,000 from your campus job. But you have a job lined up for next year once you graduate that pays $76,000. Suppose you choose to consume $40,000 in both periods.

a) Compute what the real interest rate must be. If the interest rate were higher than this, how would your level of consumption in period 1 be different (rise, fall, or ambiguous)? How about in period 2?

b) Suppose you learn in period 1 that you win a lottery that will pay off in period 2. What will happen to the level of your consumption in period 1 (rise, fall, or ambiguous)? How about your level of saving in period 1 (rise, fall, or ambiguous)? In 1-2 paragraphs, explain how this differs from the consumption behavior you assumed in the three problems above.

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