1) Keynesian Model (SR Algebraic) (20 points; 13 minutes)
Show all steps.
Consider the following economy. (You can do the additions in your head.)

$C = \overline{C} + c(Y - T) - br = 390 + c(Y\text{-}T) - 30r$

$I^p = \overline{I} - ar = 150 - 20r$

G=$\overline{G}$=100

NX=0

T= $\overline{T}$=100

MPC=c=0.9

a) (5 points) Give the general equation for AD. Derive the expression for aggregate demand for this economy in terms of Y and r.

AD = C + I + G + NX
AD=[390+0.9(Y-100)-30r] + [150-20r]+100+0
=0.9Y –50r + [390-90+150+100]=**0.9Y-50r+550**

~~b) (1 point) Give~~ the ~~exact value of autonomous aggregate demand for this economy.~~
~~550~~   **Badly worded question. Aut AE = 550 -50r**

c) (2 points) Give the general formula for the income-expenditure multiplier. Give the exact value for this economy.
multipier=1/(1-c)
1/(1-0.9)=1/.1 =10

d) (7 points) Suppose r is 10% (that is 0.10). What is SR equilibrium output? What is the output gap if Y*=5500? Is it recessionary or expansionary? By how much does autonomous expenditure need to change to eliminate the gap?

   Set Y=AD
⇨ Y=0.9Y-50x0.1+550=0.9+545 . So, 0.1Y=545
⇨ SR Eqbm Y =5450.
⇨ Gap=5500-5450=50
Recessionary gap
Using multiplier, can eliminate with increase of autonomous AD by 5
Since 50=10x5

e) (5points) What value of r eliminates the output gap if Y*=5450?

NOW SET Y*=AD , SO Y*= 0.9Y*-50r+550
⇨ SO, SET 0.1Y*=-50r+550 (or can start here, since formula is from above
⇨ 50r=550-0.1x5450, so 50r=5
⇨ r=0.1 or r=10%

2) AD-AS Analysis (Graphical) (18 points; 12 minutes)
Answer each part separately.

a) (8 points) The economy is at long-run equilibrium. Show this on the AD-AS diagram (label initial equilibrium A). The government implements an **increase in taxes** $\overline{T}$ **.** Show SR outcome (label B). Show LR outcome (label C) after the economy self-corrects. What happens to prices and production as the economy moves from B to C?

SEE mt2_graphs.pdf for REQUIRED GRAPH.

Point A: Initial state of economy. Level of inflation is π and eqbm level of output is Y*. The economy is in LR equilibrium.

Point B: State of economy in SR after tax increase, which causes AD to fall to AD'. At current level of inflation π, equilibrium output (where Y=AD) is at a level below potential Y*. There is a recessionary gap in the amount Y*-Y'.

Point C: As the economy moves from SR to LR equilibrium at point C (as explained below), inflation level falls to π' and output returns to the level of potential output Y*.

Movement from B to C : (from Slide 12 of lecture 20) Firms sell less than they anticipate. This leads firms to slow rate at which prices increase (or causes inflation rate π to fall) As π falls, Y rises and (cyclical) UR falls

b) (8 points) The economy is at long-run equilibrium. Show this on the AD-AS diagram (label initial equilibrium A). A more lenient immigrant labor policy increases Y* (label B). What stabilization policy do you suggest? What is LR outcome under the stabilization policy?

SEE mt2_graphs.pdf for REQUIRED GRAPH.

Point A: Initial state of the economy. Level of inflation is π and eqbm level of output is Y*. The economy is in LR equilibrium

Point B: The new immigration policy brings in a flood of workers and potential out increases to Y^{*NEW}. There is now a recessionary gap in the amount $Y^{*NEW} - Y = Y^{*NEW} - Y^*$. A recessionary gap means there is cyclical unemployment.

Stabilization Policy: Policy-makers want to eliminate this and will enact stabilization policy (such as an increase in G) to shift out AD to AD'.

LR Outcome Under Stabilization Policy: The economy then rapidly returns to LR equilibrium where the level of inflation is π, eqbm output is Y^{*NEW} and cyclical unemployment has been eliminated.

[Note (Aside) : Without stabilization policy, the economy would slowly self-correct to reach LR equilibrium at Y^{*NEW} and a lower level of inflation. If policy-makers did not care about unemployment and were particularly keen on low inflation, they may have chosen not to enact stabilization policy. However, concerns over the costs of unemployment lead policy-makers to enact stabilization policy, as above.]

c) (1 point) Which policy (monetary or fiscal) may affect potential output as well as aggregate demand? **FISCAL**

d) (1 point) The impact of which policy (monetary or fiscal) can be predicted more exactly? **FISCAL**

3) Definition (T/F/Uncertain) (15 points; 10 minutes)

First, define the term. **Second,** state whether statement is T/F/Uncertain. **Third,** give a succinct reason for your conclusion.

a) (5 points) If the Fed announces that it is raising the targeted Federal Funds rate from 1.75% to 2.0%, this means that the Fed will engage in selling of bonds via open market operations to bring about a reduction in bank reserves and the money supply M1.
Define Money Supply M1.

Money Supply M1: sum of currency outstanding (or in circulation) plus balances held in checking accounts)

True

Fed sells government bonds. These are paid for with checking deposits held in banks and draws down bank reserves. M1 declines.

b) False. Billdid not work inpast week. Not employed. Bill did not seek work in past 4 weeks. Not unemployed. Not in LF.

Define Unemployment Rate.

Unemployment Rate: unemployed people/(employed + unemployed).   Or, unemployed/labor force, where labor force consists of adults age 16 years and over

c) (5 points) George has financed his house with a 30-year mortgage at 6% annual interest, and he expects the inflation rate to continue at its current annual rate of 3%. An inflation shock, which causes inflation to jump to 5%, makes George worse off and the bank better off.
Define the relationship between the real rate of interest and the nominal rate of interest.

Real & Nominal Rate of Interest: Real rate of interest is the Nominal rate of interest minus the inflation rate.

False

George is made better off, since he can repay his mortgage with "cheaper dollars" and his real rate of interest is lower than he anticipated. The bank is worse off, since the market value of the mortgage has fallen.

4) Keynesian Model (SR Graphical) (10 points; 7 minutes)

Assume the U.S. economy has an expansionary gap. Assume that policy makers enact **either** monetary **or** only fiscal policy to stabilize the economy (but not both).

CHOOSE monetary or fiscal policy.

i)   Show in a Keynesian cross diagram the initial state of the economy (label A).
ii)   State the precise form of stabilization policy.
iii)   Show the effect of this policy on your diagram and explain.

SEE mt2_graphs.pdf for REQUIRED GRAPH.

<u>Point A:</u> The economy is in SR equilibrium where Y=AD with an expansionary gap, since SR equilibrium output Y > Y*.

<u>Point B</u>: Following implementation of the stabilization policy which reduces aggregate demand to AD', the economy moves to a new level of equilibrium output where Y=AD=Y*, and the expansionary gap has been removed.

<u>Stabilization Policy (Monetary):</u> Reduce AD, by decreasing the MS and increasing r. One way to do this is for the Fed to set a new lower target Federal Funds rate. This would require open market sales of government bonds. This reduces reserves and decreases the money supply.

<u>Stabilization Policy (Fiscal):</u> Reduce AD by decreasing G or increasing T. The decrease in G could occur with a reduction in spending on public goods like defense, education or welfare programs, either at the federal or state level.

5) Monetary and Fiscal Policy (12 points; 8 minutes)
Answer all parts.

a) Monetary Policy. (5 points)

Assume the U.S. economy has a recessionary gap.
i)   What type of open market operations will the Fed conduct to achieve a new targeted
        Federal Funds rate?

Fed will *reduce* target FF rate to eliminate a recessionary gap.The Fed will engage in open
market purchases of bonds. This will increase the money supply and reduce interest rates.

ii)   If reserves are changed by $X, given the current legally-required reserve-deposit
        ratio (RR), what will happen to money supply M1 (assume all money is kept in
        demand deposits)?

Reserves *increase* by X. M1=curr+DD=curr+reserves/reqresratio. Here
M1=reserves/reqresratio. So money supply increases by X/RR, since reserve deposit ratio is
RR.

b) Fiscal Policy. (7 points)

Assume the economy is characterized by the simple SR Keynesian model and that $G=\overline{G}+$
G_S, where $\overline{G}$ is autonomous and automatic stabilizer $G_S = -k(Y-Y^*)$ with 0<k<1.
i)   What is the purpose of this automatic stabilizer?

Stabilizer has effect of setting level of G_S to stabilize economy as Y fluctuates. G decreases with
expansionary gap and increases with recessionary gap.

ii)   If $C = \overline{C}+c(Y-\overline{T})$, and all other AD components except C and G are autonomous,
        what is the income-expenditure multiplier? Is it lower or higher than if all of G were
        autonomous?

1/[1-(c - k)].
So c-k < c so 1/1-c+k < 1/1-c .   So, the multiplier with stabilizer is smaller.

Extra Credit News Questions (3 points)

1)   Non-farm productivity growth was _____**5.3**____**%** over the past year ending in September, the highest it as been in 19 years.
2)   The growth rate of GDP for the 3rd quarter of 2002 was _**3.1**_____**%.**
3)   On November 6, the Fed lowered the target Federal Funds rate to __**1.25**____ % and the discount rate to___**0.75**____**%.**