Q1. Consider an economy with the following information: $Y = C + I + G$, $C = 180 + 0.7 (Y - T)$, $I = 100 - 18i + 0.1Y$, $T = 400$, $G = 400$, $P = 1$, $M = 5400$, $L = 6Y - 120i$, $M/P = L$. Derive the IS equation. Derive the LM equation. Solve the IS-LM to obtain the equilibrium output and the interest rate. Obtain the equilibrium level of consumption and investment. **[6 points]**

Q2. State TRUE or FALSE and explain your answer fully. **[4 points]**

a. A shirt manufacturer's balance sheet is: Cloth (raw materials) purchased from weavers $130; Wages paid to labor $80; Profits kept by owners of the firm $40; Total sales of finished shirts $250

The value added to GDP in this economy is $80.

b. If the consumption function is $C = C0 + C1(Y-T)$, and C1 rises, the private savings rate in the economy decreases.

c. The IS-LM model is a good description of the way the economy works in the long run.

d. In an economy where individuals demand half of their money as currency and half as checkable deposits, an expansionary increase in high-powered money by the Central Bank has a larger effect than in an economy where individuals hold all of their money as cash.

Q3. THE GOODS MARKET

[10 Points]

$Z = C + I + G$
$C = 10 + 0.8 (Y - T)$
$T = G = 50$
$I = 20$

a. Solve for the equilibrium level of output. What is the value of autonomous spending? What is the value of the multiplier? Briefly explain the role of the multiplier in the economy. **[3]**

b. Graph aggregate demand, Z, as a function of income, Y, and plot the equilibrium point from part (a) on the graph. **[2]**

Now, assume that investment is a function of the interest rate, i: $I = 40 - 100i$

Note that the investment level in part (a) corresponds to an interest rate of $i=0.2$.

c. Find the new equilibrium level of output, Y, if the interest rate falls to $i=0.1$. Show this change on your graph from part (b) and clearly label the curves on your graph. **[2]**

d. Given your answers to (a) and (c), what is the relationship between equilibrium output and the interest rate? Sketch a graph with i and Y on the axes which contains the equilibrium points from parts (a) and (c). How does this relationship change when the sensitivity of investment to the interest rate changes? Explain. **[3]**

Q4. FINANCIAL MARKETS

[10 points]

$Md = PY/50i$
$Ms = 25$
$P = 1, Y = 100$

a. Solve for the equilibrium value of the interest rate, i. Plot the graph. **[3]**

Now, assume that output falls to 75.

b. Find the new equilibrium interest rate. Show this change on your graph from part (a). Please be sure to clearly label the curves on your graph. **[3]**

c. Given your answers to (a) and (b), what is the relationship between equilibrium output and the interest rate? Sketch a graph with i and Y on the axes which contains the equilibrium points from parts (a) and (b). How does this relationship change with changes in the sensitivity of money demand to the interest rate? Explain. **[4]**

Q5. IS- LM MODEL **[20 points]**

$Z = C + I + G$
$C = 100 + .75(Y-T)$
$I = 80 + .1Y - 150i$
$G = 60, T = 40$
$Md = Y - 3000i$
$Ms = 1000$

a. Derive the IS and LM curve. **[2]**

b. Find the equilibrium values of i and Y. Graph your answers to (a). Be sure to label the curves IS and LM. **[3]**

c. Assume the government adjusts taxes to eliminate the budget deficit. On a new graph, show the effects of this change on the model. Do not redo the algebra, simply show how the curves move as a result of the change. Show both the old and the new equilibrium levels of Y and i. What is the effect of the policy on equilibrium output and interest rate? Is this a fiscal expansion or contraction? **[5]**

d. What can the central bank do to offset the effect of the tax change on equilibrium output? How will the central bank intervene in the bond market to accomplish its goal? Using the IS-LM model, show the effects of the central bank's actions on a new graph that also includes all of the lines from your graph in part (c). What is the effect on equilibrium output and interest rate relative to part (c)? **[5]**

e. Now return to the original assumptions of the model, where G and T are fixed. The leaders of the government decide that they would like to increase investment in the economy. They institute successful policies – such as advertisements, speeches, etc. — that increase the personal savings rate (i.e. lower the marginal propensity to consume.) At the same time, they ask the Fed to use monetary policy to lower interest rates. After these policies take effect, the government is surprised to find that output has not changed at all. Are you surprised? Why or why not? Why might the government want to encourage investment? **[5]**

Economics of Entrepreneurship (EP60008) **ASSIGNMENT#1**

Q.1 Suppose structural model for the product market is given as follows:

$C = 100 + 0.80\ (Y\text{-}T)$
$S = -100 + 0.20\ (Y\text{-}T)$
$I = 200 - 1080i$
$G = 100$
$T = 50 + 0.20Y$

Find the following:

(a) Equilibrium equation ($G + I = S + T$) for the product market. [$Y = 360 + 0.64Y - 1080i$]
(b) Function for the IS curve. [$Y = 1000 - 3000i$]
(c) Shift in the IS schedule if deficit-financed $\Delta G = 72$ [Shift in IS Schedule = $200Y$]
(d) Shift in the IS schedule if tax rate (t) is raised from 0.20 to 0.25 [$Y = 900 - 2700i$]
(e) Shift in the IS schedule if $\Delta G = 72$ and $\Delta t = 0.05$ [$Y = 1080 - 2700i$]
(f) Net effect of fiscal policy change on the equilibrium level of income and interest. [Draw the graph comparing with equilibrium state and the final changes in (f)]

Q.2 For the economy with the following specifications:
$C = 100 + 0.9Y_d$; $t = (1/3)Y$; $I = 600 - 30i$; $G = 300$; $M_t = 0.4Y$; $M_{sp} = -50i$; Nominal money supply, $M_S = 1040$; $P = 2$; Full employment level of income = 2500

(a) Derive the IS and LM equations and compute the equilibrium levels of income and rate of interest [IS equation: $Y = 2500 - 75i$; LM equation: $Y = 1300 + 125i$; $i = 6\%$; $Y = 2050$]
(b) Compute the change required in the level of government expenditure to achieve full employment level of income [$\Delta Y = Y_F - Y$, where Y_F is full employment, $\Delta Y = 2500 - 2050 = 450$. Now ΔG can be obtained as $\Delta G = 450/G_{mc}$. Here, G_{mc} is fiscal multiplier adjusted for the crowding out effect of rise in the interest rate. The adjusted fiscal multiplier is used to account for the crowding out effect arising out of increase in govt. spending and the consequent increase in the interest rate.
$G_{mc} = 1 / (1 - b + bt) + hk / l$ where $b = \Delta C/\Delta Y = 0.9$; $h = \Delta I/\Delta i = 0.4$; $k = \Delta M_t/\Delta Y = 30$ and $l = \Delta M_{sp}/\Delta i = 50$ hence $G_{mc} = 1.5625$. So, $\Delta G = 450/1.5625 = 288$. Hence a $\Delta G = 288$ will increase income to full employment level of 2500.]
(c) Explain the change in position of IS and LM curves if MPC changes to 0.60 [Changes in IS curve: $Y = 1666 - 50i$; however change in MPC does not affect LM curve because it is independent of MPC.]
(d) What is budget surplus? Explain why an increase in the government purchases will reduce the budget surplus by less than increase in government purchases?

Q.3 An economy shows the following features:
Consumption, $C = 86 + 0.8\ Y(d)$ where, Y(d) = Disposable income,
Transfers $TR = -20$
Investment $I = 240 - 20r$
Government Expenditure $G = 60$
Exports $X = 40$
Imports $M = 30 + 0.05Y$ (where, Y = National income)
Transaction and precautionary demand for money, $M(1) = 0.5Y$
Speculative demand for money, $M(2) = 300 - 40r$
Supply of money, $M(s) = 440$
National income at full employment, $Y(f) = 1100$

(a) What are the equilibrium values of income and rate of interest? [$r = 7.75\%$; $Y = 900$]
(b) What shall be the additional exports in order to achieve full employment? [$\Delta Y = Y_F - Y$ i.e., $1100 - 900 = 200$. $\Delta Y = (1/\ 1 - b + bt + m)\Delta X$ where $m = 0.05$ from import function; $t = 0$. Hence, $\Delta X = 50$
(c) How will the additional exports be affected if the tax function, $T = 10 + 0.1Y$ is introduced? [New IS equation is $Y = 1127 - 60.6r$, hence $r = 6\%$ (approx..) and $Y = 760$. New $\Delta Y = 1100 - 760 = 340$. Given the model, $\Delta Y = (1/\ 1 - b + bt + m)\Delta X$, so $\Delta X = 340 \times 0.33 = 112$. Hence ΔX increases from 50 to 112]

Q.4 The following equation describes an economy:
Consumption $C = 100 + 0.8Y_d$

Economics of Entrepreneurship (EP60008) **ASSIGNMENT#1**

Investment $I = 150 - 6i$
Government Expenditure, $G = 100$
Income tax $t = 0.25\ Y$
Real demand for money, $M^d = 0.2Y - 2i$
Nominal money supply, $Ms = 300$
Price level, $P = 2$

(i) Compute the equilibrium level of income, Y and interest rate, i. [i = 5%; Y = 800]

(ii) Suppose the economy opens up with the following exports (X) and import (M) equations.

$X = 100$ and $M = 20 + 0.1Y$

Find the new level of equilibrium income and interest rate if all other equations remain unchanged. [i = 5%; Y = 800, No change]

(iii) Find direction and magnitude of the shift in the LM curve if the nominal money supply is doubled.

(iv) How is your answer in part (i) affected if price is also doubled along with nominal money supply? [No change in Y and i]

Q1. A three-sector model assuming simultaneous and different changes in fiscal and monetary matters is given as, $C = 100 + 0.75Y_d$; $I = 250 - 4i$; $G = 150$; $T = 40 + 0.20Y$; Transfer Payments $TR = 40$; $M_t = 0.25Y$; $M_{sp} = -20Y$; Nominal supply of Money, $M_S = 1000$; Price level, $P = 5$. **[3 x 3 = 9]**

Estimate the following aspects and variables:

(a) The equilibrium rate of interest and the level of income

(b) The crowding-out effect of additional government spending of Rs. 50 billion on the equilibrium income and the interest rate

(c) Increase in real money supply (ΔM_S) required to counter balance the crowding-out effect of government expenditure

Q2. For the economy with the following specification: **[2 x 3 = 6]**

$C = 100 + 0.9Y_d$; $T = (1/3)Y$; $I = 600 - 30i$; $G = 300$; $M_t = 0.4Y$; $M_{sp} = -50i$; Nominal money supply, $M_S = 1040$; $P = 2$; $Y_f = 2500$

(a) Derive the IS and LM equations and compute the equilibrium levels of income and rate of interest

(b) Compute the change required in the level of government expenditure to achieve full employment level of income

(c) Explain the change in position of IS and LM curves if MPC changes to 0.60

Q3. You work for a leading investment banking company. Your colleague is worried that increased government spending in India as reflected in the burgeoning budget deficits can adversely affect private investment and household consumption spending. Would you agree with her fully? Under what circumstances could she be right? Could there be situations when you could argue against her viewpoint? Elaborate. **[5]**

Q1. What is the effect of the following on bond prices (i) peoples' fear of recession (ii) inflation? **[2+2=4]**

Q2. Suppose: $C = 40 + 0.75(Y_d)$; Tax $T = 80$; Investment $I = 140 - 10i$; Govt. expenditure $G = 100$; Money demand $M^d = 0.2Y - 5i$; Money supply $M^s = 85$ (i is % and other figures in Rs. crore) **[2x3=6]**

a. Compute the equilibrium income, Y and interest rate i.
b. Suppose the govt. increases its expenditure on education and health services by Rs. 65 crore. What would be the impact on equilibrium income? Explain with the help of diagram.
c. What is budget surplus? Explain why an increase in the government purchase will reduce the budget surplus by less than increase in government purchases?