Midterm Practice Exam
Macro Economics

Institute for Financial Management & Research (Batch: 2019-21)

October, 2019

Maximum Points: 60 **Duration**: 150 minutes

Instructions and Advice:

- The question paper is divided in two sections- Part A and Part B.
- You need to answer 7 questions in all. [2 from Part A, and 5 from Part B]
- You can choose between Question 1 and Question 2, and between Question 3 and Question 4.
- All other questions are compulsory.
- Please be brief and precise in your answers. Unnecessarily lengthy answers will attract penalty.
- Please label your graphs correctly.
- At no point of this examination you are allowed to ask clarificatory questions. Make reasonable assumption if you have doubts and proceed to answer the question.
- You are **not allowed** to use calculator in the exam.
- There is plenty of time. Use it wisely, do not rush.
- All the best!

Part A

1. (4 points) *Consider a bond that promises to pay ₹500 in one year.*
   (a) (2 points) What is the relation between the price of the bond and the interest rate?
   (b) (2 points) If the interest rate is 10%, what is the price of the bond today?

   Or

2. (4 points) *The GDP can be broken down into four components- consumption(C), investment (I), and government purchases (G)- according to*:
   $Y = C + I + G$.

   Identify to which component ($C, I,$ or G) would the following belong:
   a. An Indian laptop purchased by the Maharashtra state government.
   b. An Indian laptop purchased by an Indian consumer.
   c. An Indian laptop purchased by Wipro.
   d. An Indian laptop sold on OLX.

3. (6 points) *Suppose that the production function is given by*

$$Y = 0.5\sqrt{K} \cdot \sqrt{N}$$

   (a) (3 points) Derive the steady-state levels of output per worker and capital per worker in terms of the saving rate, s, and the depreciation rate, δ.
   (b) (3 points) Derive the equation for steady-state output per worker and steady-state consumption per worker in terms of s and δ.

   Or

4. (6 points) *Suppose that the markup of goods prices over marginal cost is 5%, and that the wage-setting equation is*

$$W = P \cdot (1 - u)$$

   , where u is the unemployment rate.
   (a) (2 points) What is the real wage, as determined by the price-setting equation?
   (b) (1 point) What is the natural rate of unemployment?
   (c) (3 points) Suppose that the markup of prices over costs increases to 8%. What happens to the natural rate of unemployment? Explain the logic behind your answer.

Part B

5. (10 points) *Suppose the economy is characterized by the following behavioural equations:*

$$C = c_0 + c_1 \cdot Y_D$$
$$I = b_0 + b_1 \cdot Y$$
$$G = \bar{G}$$
$$T = t \cdot Y$$

(a) (2 + 3 points) Solve for equilibrium output. What is the value of the multiplier?

(b) (5 points) Suppose that now business confidence is up, and there is a shift in the investment equation.

$$I = 2b_0 + b_1 \cdot Y$$

Compute the change in equilibrium output, the change in investment, and the change in national savings.

6. (10 points) *Suppose that a person's wealth is ₹50,000 and her annual income is ₹60,000. Also, the money demand follows the following equation*

$$M^d = Y \cdot (0.35 - i)$$

(a) (2 + 2 + 2 points) Derive the demand for bonds. Suppose that interest rate is down by 10 percentage points. How will the demand for bonds be impacted?

(b) (2 points) Explain the impact of rising wealth on the money demand and the demand for bonds.

(c) (2 points) Explain how shifts in annual income will impact the money demand and the demand for bonds.

7. (10 points) *Consider the following equations:*

$$\begin{aligned} C &= 400 + 0.4 \cdot Y_D \\ I &= 200 + 0.1 \cdot Y - 1000 \cdot i \\ G &= 400 \\ T &= 0.1 \cdot Y \\ \left(\frac{M}{P}\right)^d &= Y - 4000 \cdot i \\ (M/P)^s &= 600 \end{aligned}$$

(a) (3 points) Derive the IS curve, and the LM curve. Solve for the equilibrium output and income.

(b) (3 points) Now suppose that government expenditure is up by 100%, and nominal money supply is now $M^s = 1000$. Calculate the new equilibrium output and interest rate.

(c) (2 points) Explain in words your findings for part (b) of the question.

(d) (2 points) Show your answer to part (b) on a graph.

8. (10 points) *Suppose the economy begins with output equal to its natural level. Then, the RBI announces a rate cut.*

(a) (5 points) Using the $AS - AD$ model, show the effects of interest-rate cut on the position of the AD, AS, IS, and LM curves in the medium run.

(b) (5 points) What happens to output, the interest rate, and the price level in the medium run?

9. (10 points) *In a country called Chintu Rashtra, there are two goods that are very popular amongst consumers- ice cream, and pizza. So, the price level- as you learnt in the very first lecture of this course- in this economy is determined by these two goods' prices. The price-quantity schedule for years 2017, and 2018 is given below.*

	Ice Cream		Pizza	
	2017	2018	2017	2018
Price	10	15	20	15
Quantity	50	40	25	25

(a) (4 points) Compute the nominal GDP, the real GDP, the GDP deflator, and the CPI for both years.

(b) (6 points) Now, imagine a situation where the 2018 ice cream price is higher than 2017 price by x percent, and 2018 pizza price is lower than 2017 price by y percent. Write down the mathematical condition involving x and y such that the CPI in 2018 would be greater than 1.