**HOWARD UNIVERSITY**

**DEPARTMENT OF ECONOMICS**

**CODE NUMBER \_\_\_\_\_\_\_\_\_ TOTAL NUMBER OF PAGES \_\_\_\_\_\_\_\_**

**September 6, 2017**

**COMPREHENSIVE EXAMINATION:**

**MACROECONOMIC THEORY/ M.A.**

**EXAMINERS:**

1. **Dr. Mika Kato, Chairperson**
2. **Dr. Gerald Daniels**
3. **Dr. Gaminie Meepagala**
4. **The examination is scheduled between the hours: 9:30 a.m-1.00 pm**

**ALL STUDENTS ARE TO BE SEATED BY 9:15 a.m.**

1. **YOU ARE REQUIRED TO ANSWER ONLY FIVE (5) QUESTIONS.**

**Any additional questions answered over the required number from each category will NOT receive credit.**

1. **Correct answers to questions NOT asked will receive NO credit.**
2. **Be sure to write the Code Number assigned to you in the TOP LEFT HAND CORNER OF THIS SHEET AND ON EACH ANSWER SHEET. DO NOT WRITE YOUR NAME ON ANY SHEET OF THE EXAMINATION.**
3. **Begin each question on a new page. Number each page used in sequence. Write only on one side of the paper.**
4. **Write clearly and illustrate your answers with graphs whenever and wherever possible.**
5. **USE ONLY BLACK INK PENS.**
6. **At the end of the examination, please indicate the total number of pages being submitted in the space provided in the TOP RIGHT HAND CORNER of this sheet.**

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1. **Bring your pens, pencils, calculators and rulers.**
2. **No briefcases, book bags or sacks, no handbags larger than 10 x 6 of any form are to be brought into the examination room.**
3. **No books, notes or other study material are to be brought into the examination room.**
4. **During the Examination there is to be no communication between or amongst students for any purpose. All questions must be directed to and channeled through the faculty member conducting the examination.**
5. **Only the scrap paper provided by the proctor is to be used for the examination. Scrap paper should bear the code number assigned to each student, and be handed over to the proctor along with the examination.**
6. **Students are not expected to leave the examination room before completing their examination and turning it in to the proctor.**
7. **NO FOOD OR SMOKING is permitted in the examination room.**
8. **It is the student’s responsibility to remove any coffee or water containers taken into the examination room.**
9. **NO CELL PHONES ARE ALLOWED.**
10. **EXAMINATION RESULTS WILL ONLY BE GIVEN TO STUDENTS WHO ARE REGISTERED.**

**Revised 09/07/2004**

**CODE NUMBER\_\_\_\_\_\_\_\_\_\_\_**

**STUDENTS: PLEASE CIRCLE ONLY THE QUESTIONS ANSWERED AND PROVIDE THE PAGE NUMBERS.**

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| **QUESTIONS** | **PAGE NUMBERS** |
| **1.** |  |
| **2.** |  |
| **3.** |  |
| **4.** |  |
| **5.** |  |
| **6.** |  |
| **7.** |  |
| **8.** |  |

**M.A. MACROECONOMIC THEORY**

**COMPREHENSIVE EXAMINATION FALL 2017**

**PART A. ANSWER ALL THREE (3) QUESTIONS 1-3.**

1. **Write short definitions for (a)-(g). Use diagrams and/or equations where appropriate.**
2. Steady-state equilibrium
3. Tobin’s q-Theory of investment
4. Golden rule
5. Physical capital
6. The business cycle
7. Balanced growth
8. Temporary technology shock
9. **For the centrally planned model**

**,**

**, and**

**,**

**where is output, is consumption, is investment, is the capital stock and the objective is to maximize**

**.**

**Answer questions (a)-(c).**

1. Use the national income identity, capital accumulation equation, and production function to define the economies resource constraint.
2. Define the Lagrangian for the centralized economy.
3. Determine the first order conditions for (b).
4. **According to the IS-LM model, what happens in the short run to the interest rate, income, consumption, and investment under the following circumstances? Use diagrams as well as a written explanation.**

**Answer questions (a)-(c).**

1. The central bank increases the money supply.
2. The government increases government purchases.
3. The government increases taxes

**PART B. ANSWER ANY TWO (2) QUESTIONS FROM QUESTIONS 4-8.**

1. **Country A and country B both have the production function**

**.**

**Both countries have constant savings rates and capital accumulation equation given by**

**,**

**where is output per capita, is capital per capita, is the rate of capital depreciation, and is the rate of population growth. The parameters and are assumed to be nonnegative.**

**Answer questions (a)-(d).**

* 1. Write the production function in per capita terms
  2. Determine the marginal product of capital and labor for the production function
  3. Using the capital the capital accumulation equation and the production function, in per capita terms, to determine the steady state level of capital and output, both in per capita terms.
  4. Suppose that population growth rate is higher in country A relative to country B, how would this effect their relative steady states?

1. **Consider the following centrally-planned model with labor:**

**where the objective is to maximize**

**where is output, is consumption, is investment, is the capital stock, is employment, and is leisure, . The parameters and are assumed to be nonnegative.**

**Answer questions (a)-(d).**

1. Define the Lagrangian for the centralized economy.
2. Determine the first order conditions for (a).
3. Obtain the long-run solution.
4. What are the implied long-run real interest rate and wage rate?
5. **Prove each of the following statements about the steady state of the Solow model with population growth and technological progress.**

1. The capital-output ratio is constant.
2. Capital and labor each earn a constant share of the economies income.
3. Total capital income and total labor income both grow at the rate of population growth plus the rate of technical progress, .
4. The real rental price of capital is constant, and the real wage grows at the rate of technological progress .
5. **Suppose we allow for technological progress, the utility and production function are given by**

**and**

**.**

**In addition, capital accumulation and labor are given by**

**The parameters and and initial level of for labor, , are assumed to be nonnegative.**

**Answer questions (a)-(d).**

* 1. Write the utility function, production function, and capital accumulation equation in terms of per effective labor input.
  2. Using (a) define the Lagrangian for the centralized closed economy.
  3. Determine the first order conditions for (a).
  4. Using (c), determine the Euler equation.

1. **Consider the fictional economy of Hayward. The consumption function is given by**

**.**

**The investment function is**

**Government purchases and taxes are both 500.**

**Answer questions (a)-(c).**

1. For this economy, express the IS curve as *r*(*Y*) and graph the IS curve.
2. Assume that the money demand function in Hayward is

the money supply is 3,000 and the price level is 3. Express the LM curve as *r*(*Y*) and graph and LM curve.

1. For the initial value of monetary and fiscal policy, derive and graph an equation, *Y*(*P*), for the aggregate demand curve. What happens to this aggregate demand curve if the central bank pursues contractionary monetary policy?