Sample Tasks for the Mid-Semester and End-Semester Exams

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The following questions / tasks may arise in the exam. The test will be structured as follows: one short essay question, one model formalization / mathematical derivation task, and one model application & calculation in Excel. Questions / tasks for 2nd mid-semester exam are in red. 2nd mid-semester exam does not contain questions for the 1st mid-semester exam. End-semester exams held in the examination period can contain question retaled to both of the mid-semester exams.

ESSAY QUESTIONS

1. What do you know about John Maynard Keynes?
2. Define Gross Domestic Product by production, income and expenditure approaches!
3. What do you know about Wassily Leontief?
4. Describe the standard structure of an input-output table!
5. What kind of final demand input-output multipliers (output, value added, etc., type 1 and type 2) do you know? What do the various multipliers show? Give a short definition to each one. What is the difference between Type 1 and Type 2 final demand multipliers?

10 points for each question

MODEL FORMALIZATION TASKS

1. Derive the formulae for equilibrium GDP and the income-expenditure multiplier in simple closed Keynesian model, where consumption, C is a linear function of the national income, Y, $C(Y) = C_0 + \hat{c}Y$, and investments, I and government spending, G are exogenous variables! Show the multiplier mechanism in the Keynesian cross diagram! Add comments to your charts!
2. In a simple two-region Keynesian model we have Country A and Country B. They have consumption and import functions, $C_A = c_A Y_A$, $C_B = c_B Y_B$, $M_A = m_A Y_A$, and $M_B = m_B Y_B$, respectively, where Y is the GDP, c is the consumption rate, and m denotes the import rate (in proportion to GDP). The share of B in A's imports is $s_{M_A}^B$, and the share of A in B's imports is $s_{M_B}^A$. Investments (I_A and I_B),

government spending (G_A and G_B), and exports to the rest of the world (X_A^{row} and X_B^{row}) are exogenous variables. Derive the formulae for equilibrium GDPs of Country A and B in a form of a matrix equation!

3. Describe the demand-driven Leontief input-output model (the most important logical connections and the direction of causality in the input-output table)! Add comments and textual explanations to your equations! (slides 46-49)

10 points for each task

MODEL APPLICATIONS AND NUMERICAL CALCULATIONS IN EXCEL

1. In a simple two-region Keynesian model we have Country A and Country B. Consumption and imports are a fixed proportion of GDP with the following consumption and import rates: $c_A = 0.7$, $c_B = 0.75$, $m_A = 0.65$, and $m_B = 0.3$, respectively. The share of B in A's imports is $s_{M_A}^B = 75\%$, and the share of A in B's imports is $s_{M_B}^A = 30\%$. Investments ($I_A = 100$ and $I_B = 400$), government spending ($G_A = 200$ and $G_B = 600$), and exports to the rest of the world ($X_A^{row} = 500$ and $X_B^{row} = 1000$) are exogenous variables (given in the same currency). Calculate the equilibrium GDPs of Country A and B in Excel! How much is the multiplier of Country A's GDP in respect of the elements of Country B's exogenous demand? What are the causes of this high/average/low value? How much GDP-growth (in percentage terms) can be expected in the two countries if Country A can increase its exports to third countries by 10 percent (with all the other parameters unchanged)?

2. In a simple model two-product and two-industry economy, we have the following Use and Supply tables assembled by the Statistical Office based on business questionnaire.

Use Table

		Industries		Final
		1	2	Demand
Domestic	A	5	50	55
Commodities	B	35	5	60
Import Use		30	25	25
Value Added		50	10	

Supply Table

	Industries	
	1	2
	100	10
	20	80

Generate the symmetric industry-by-industry input-output table from Use and Supply tables using the fixed product sales structure method! What is the estimated value of the purchases of domestic Industry 1 from domestic Industry 2?

3. The final demand, intersectoral relationship, output and value added production in a base year can be described with the following input-output table. The final demand for agricultural products is growing by 3%, industrial final output is decreasing (!!!) by1%, and the final demand for services is increasing by 5% from base to current year. Using the open (Type 1) input-output model, determine the values of the individual cells of the input-output table

for the current year! How much does the GVA production of individual sectors and the whole country grow (in value and percentage terms)?

billion HUF (unless indicated otherwise)	Agriculture	Industry	Services	Final demand	Total Output
Agriculture	462	530	265	843	**2,100**
Industry	315	3,710	1,855	20,620	**26,500**
Services	231	2,650	6,095	17,524	**26,500**
Imports	273	12,720	3,445		
Gross Value Added	819	6,890	14,840		
of which labour incomes	420	3,180	9,275		
Total Input	**2,100**	**26,500**	**26,500**		
Number of employees (thousand people)	288	1,170	2,543		
Emission of greenhouse gas (thousand tons)	7,510	37,940	10,270		

10 points for each task