

PART B

1.

a) Discuss the main assumptions of classical and environmental input-output analysis. (4 marks)

b) Consider Table 1. It is an Input-Output Table of an hypothetical economy:

Table 1. Input-Output Table (£ million)

	<i>Intermediate Sectors</i>			<i>Final Demand</i>		<i>Total Output</i>
	Agriculture	Manufacturing	Services	Households	Exports	
Agriculture	0	520	0	650	130	1300
Manufacturing	455	0	195	1040	910	2600
Services	130	260	0	390	0	780
Imports	325	780	65			
Wages	260	650	390			
Other Value Added	130	390	130			
Total Inputs	1300	2600	780			

i) Compute the direct requirements matrix and use the second order approximation of the Newman series to approximate the Leontief's inverse (*use k = 2*)

(7 marks)

ii) Interpret the coefficients of the manufacturing sector of the Leontief's inverse.

(3 marks)

iii) Table 2 shows the amount of direct SO₂ emissions measured in tonnes of SO₂ emitted per million of pound of spending on domestic production of the hypothetical economy:

Table 2. Direct CO₂ emissions

	<i>Agriculture</i>	<i>Manufacturing</i>	<i>Services</i>
SO₂	1600	400	550

Define and compute the indirect emission vector and interpret its values.

(7 marks)

iv) Discuss the rationale of *linkage* effects to environmental IO analysis.

(4 marks)

2. Discuss the UNSTAT proposal of environmental satellite accounting and its practical limitations. **(25 marks)**

3. Table 3 reports the results of the EKC panel data regression model. Results include individual and time specific effects. The depended variable is the log of CO2 emissions measured in tonnes per capita. The independent variables are the log of GDP per capita measured in 1990 real international dollars, the GDP square and the log of OPEN. OPEN indicates the degree of free trade liberalisation of a country and is obtained as the ratio of imports plus exports to GDP. The sample is composed of 104 countries. The time period considered is 1990-2000. P-values for regression coefficients and Hausman test are expressed in parenthesis.

Table 3. EKC Panel Data Model Regression Results

REGION	WORLD		OECD		NON-OECD	
	Model	Fixed Effect Model	Random Effect Model	Model	Random Effect Model	Model
LGDP	2.53 (0.0005)	1.80 (0.0033)	0.88 (0.0000)	0.95 (0.0000)	0.79 (0.0000)	0.85 (0.0000)
LGDPSQ	-0.68 (0.009)	-0.45 (0.0000)	-0.34 (0.0052)	-0.32 (0.00189)	-0.67 (0.0423)	-0.69 (0.0215)
LOPEN	-0.70 (0.0028)	-0.50 (0.0000)	-3.54 (0.0031)	-2.35 (0.0182)	4.20 (0.0000)	2.86 (0.0000)
Constant		-2.92 (0.0225)		-23.7 (0.0005)		-4.15 (0.0044)
Hausman Test	15.33 (0.0000)		5.65 (0.13220)		14.24 (0.00433)	

a) Discuss the economic and statistical significance of LOPEN in the NON-OECD sample estimated with the Fixed Effect Model. **(3 marks)**

b) Discuss:

- i) The use of OLS vs panel data regression models in EKC studies. **(10 marks)**
- ii) The appropriateness of Random Effect Model and Fixed Effect Model for the OECD sample. **(3 marks)**

c) Compute the turning points with respect to log GDP for the WORLD sample and for both Fixed and Random Effect Models. **(3 marks)**

d) Discuss the policy implications of the estimated EKC panel regression model. **(6 marks)**