MEMO ECS304G OCTOBER 2010

QUESTION 1

(a) $$MRPT_{xy} = \frac{MCx}{MCy} = \frac{Px}{Py} = MRS^{a}{}_{xy} = MRS^{b}{}_{xy}$$

(b) direct = no shifting eg income

Indirect = shifting eg VAT

(c) Income effect = **work more** to offset lower after-tax income

(d) spatial externalities – spill over to other jurisdictions

economies of scale

lower administration costs and compliance costs in financing public services

(e) benefits nonrival and nonexcludable = public

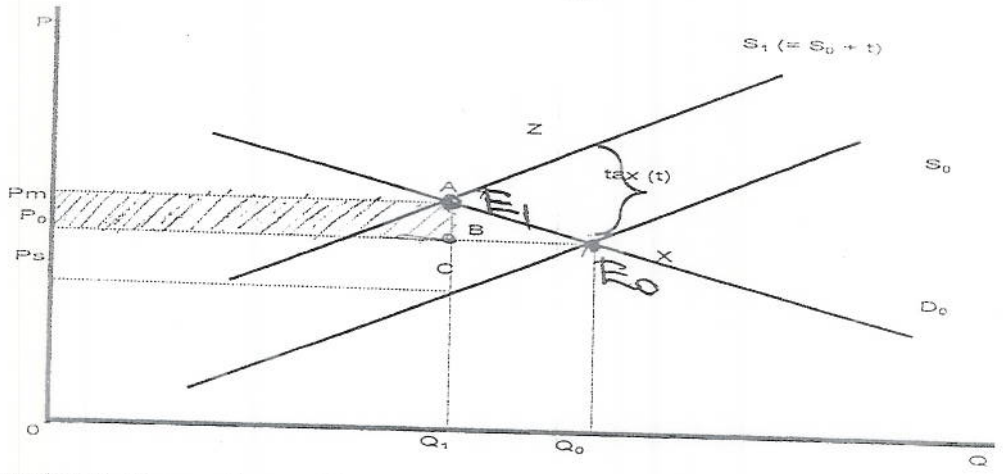
(10)

(4)

QUESTION 3 / VRAAG 3

(a) Analyse, with the aid of a diagram, the tax incidence of a unit tax levied on the suppliers of caviar (ie demand is price elastic). Assume a 'normal' supply curve that increases from left to right. (10)

[6] + diagram [4]



Impose unit tax on **suppliers** at P_0 and Q_0

1 Sellers add tax at each quantity
eg at Q_0 ...P_0 + tax... point Z on new supply curve

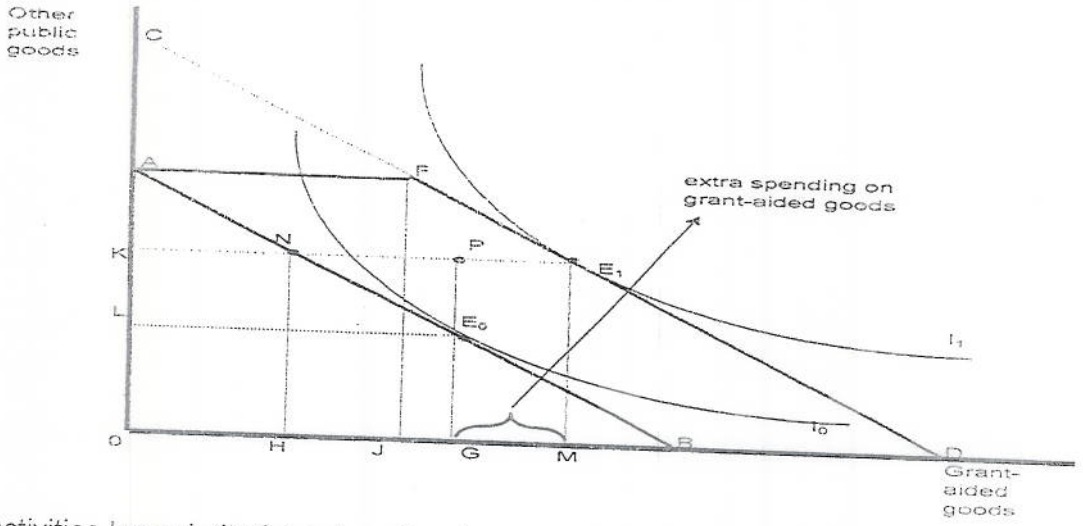
2 Effective **supply curve shifts parallel** (S_0 to S_1)

3 At new equilibrium A (P_m and Q_1):

price paid by buyers	= P_m = market price
price received by sellers	= P_s = P_m - tax
total tax burden (revenue)	= P_mACP_s
share of buyers... P_0 to P_m	= P_mABP_0
share of seller... P_0 to P_s	= P_0BCP_s

4 share of seller greater if demand is elastic

(b) Draw a diagram to illustrate the impact of a conditional nonmatching intergovernmental grant. Give one reason why national government would make such a transfer to other levels of government. (5)

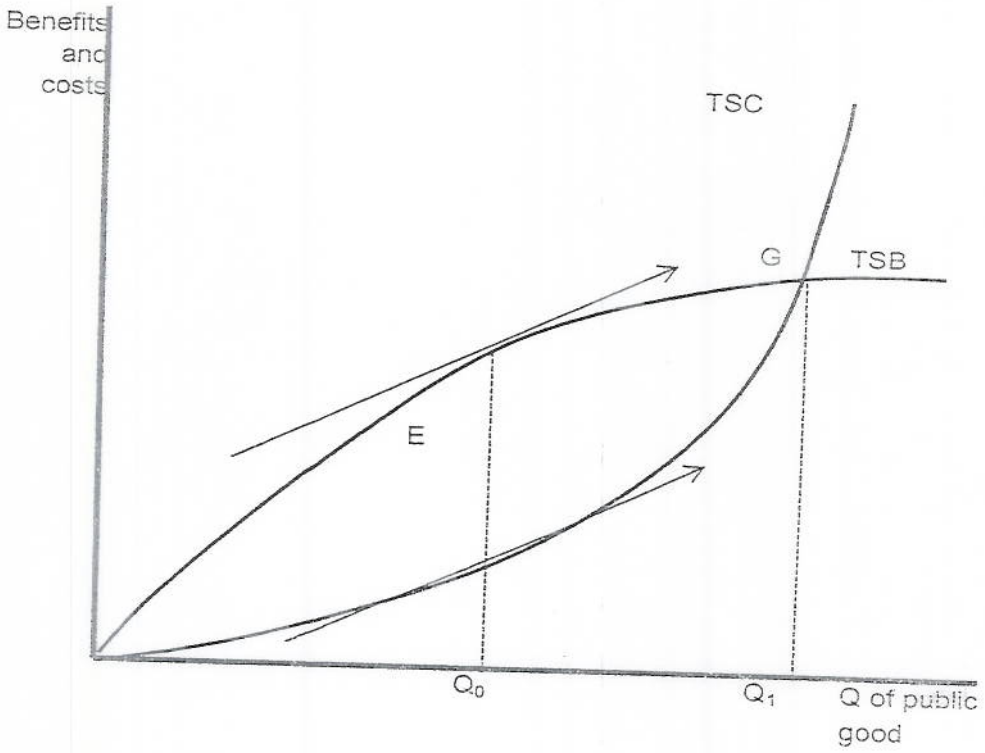


activities low priority for sub-national government but NB for central government

(b) Explain using total social cost and total social benefit curves how the maximising behaviour of bureaucrats could contribute to an oversupply of public goods (the Niskanen model of bureaucratic failure). Is this a plausible explanation for excessive state intervention in the economy? Explain your answer.

(10)

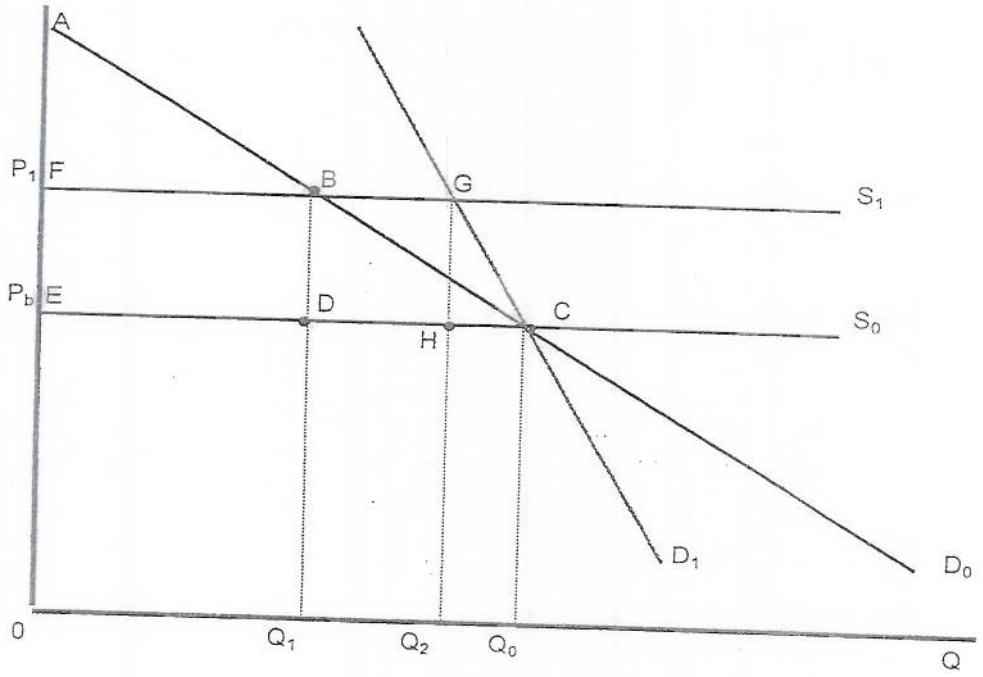
(diagram = 4)



- Salaries, power, prestige positively related to budget size
- Total costs rises at increasing rate
- Total benefits increase at a decreasing rate
- The slopes of total costs and benefit curves determine marginal rates of change
- Social optimum level where MSC = MSB (at Q_0) or where distance between TSB and TSC is greatest (distance E)
- Bureaucrat maximises budget where TSB = TSC (at Q_1)
- Are politicians and taxpayers at mercy of bureaucrats?
- Budgetary procedures more transparent
- Salaries of senior public servants not linked to size of budgets

QUESTION 6 / VRAAG 6

(a) Explain with the aid of a diagram why it would be efficient to tax goods with price-inelastic demands (assume a horizontal supply curve). What are the equity implications of this elasticity rule? (10)



- Demand D_0 is more elastic than D_1
- Assuming constant returns the supply is S_0
- Impose selective tax and supply shifts to S_1
- In the case of (price) sensitive demand curve D_0 quantity demanded decreases to Q_1 and for the (more) insensitive demand curve D_1 it decreases to Q_2
- The excess burdens are BCD (for D_0) and GCH (for D_1)
- Where demand is inelastic the excess burden is less for the same tax rate change – (economically) more efficient
- The government revenue for D_0 is FBDE and for D_1 it is FGHE
- From revenue perspective it is again better to tax price inelastic commodities

BUT, there are equity implications:

- Price elasticity of demand for necessities tends to be low compared to luxury goods
- Elasticity tax rule implies that high tax rate on (e.g.) bread would be efficient (excess burden is small)
- But expenditure on bread is major proportion of income of poor people – tax therefore regressive and inequitable

QUESTION 7 / VRAAG 7

(a) Contrast the policy options government could use to address inefficiencies caused by an "artificial" (or statutory) monopoly and a natural monopoly. (10)

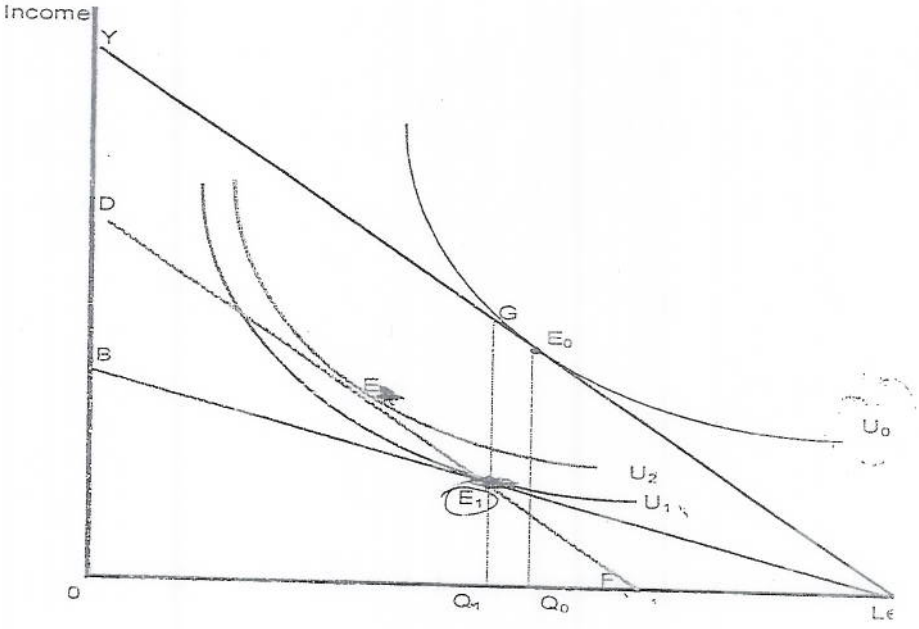
Artificial

1 deregulation (remove barriers to entry)
2 do nothing (long term... D curve becomes flatter)... markets are contestable
3 tax policy
   - income tax - no allocation effect.... (profits)
   - unit tax - shift AC and MC up... Q↓ & p↑
   - lump-sum tax - AC shift up no allocation effect
4 price control (P = MC)... how is MC measured?

Natural

- regulate or nationalise
- marginal cost pricing + unit subsidy (= loss)
- finance subsidy – higher tax or borrowing (higher interest) causes distortion

(b) Explain, with the aid of a diagram, the excess burden of a personal income tax on labour income. (You may leave out the discussion of the income and substitution effects of the tax.) (10)



- On budget line YL equilibrium at E_0 with supply of labour = LQ_0 & welfare on U_0 [2]
- Impose [proportional] pers income tax, after-tax budget line pivots from LY to LB
- new equil at E_1, welfare lower on indiff curve U_1, labour supply=LQ_1
- tax= E_1G
- *Excess burden*: compare income tax to lump-sum tax to raise tax revenue = E_1G
- Lump-sum tax shift budget line parallel from YL to DF intersecting at E_1
- New equilibrium at E_3 on higher indifference curve U_2
- Difference between U_2 and U_1 is an **excess burden**

(b) Peter drives a new BMW and pays R20 toll at the Robme toll road plaza. Lizzy drives a battered VW Beetle and also has to pay R20. Peter earns R50 000 a month and Lizzy earns R2 000 a month. Discuss the structure of the toll fee considering:

i fairness in terms of the benefit principle of taxation
ii fairness according to ability-to-pay principle
iii proportionality/progressivity/regressivity with respect to the
- monetary value of the tax base
- unit of taxation (i.e. number of cars)
- income base

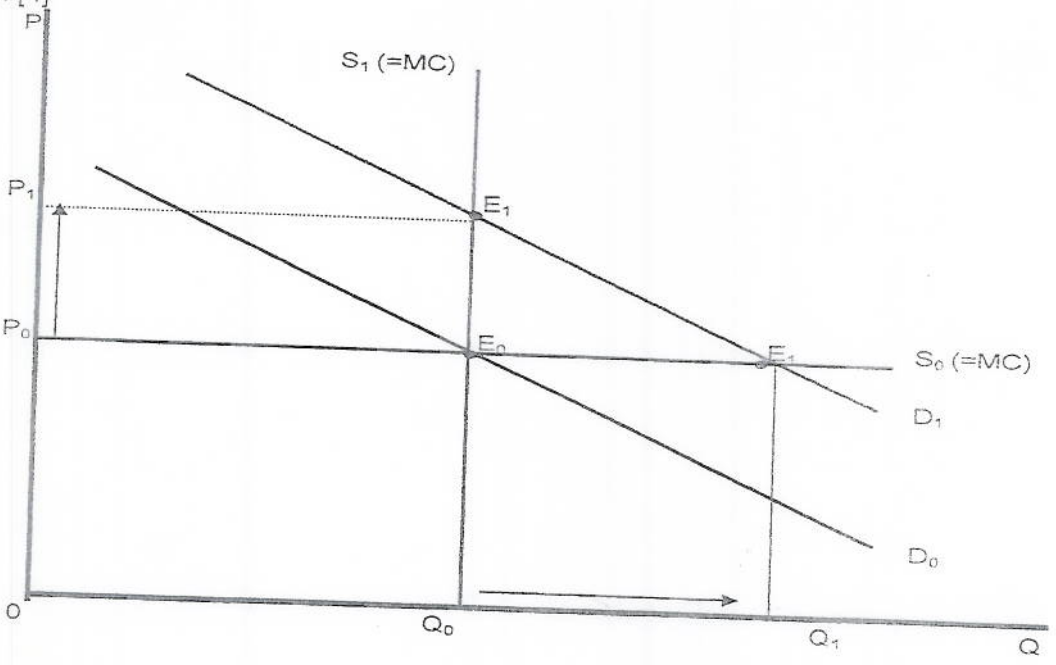
(10)

- fair in terms of the benefit principle since the user pays for the benefit of using the road. There is no forced carrying.
- Not fair when we apply the vertical ability-to-pay principle - two individuals have differing capacities but pay the same
- Monetary base = regressive - the value of the base increases from a cheap car to an expensive car. The tax amount remains the same and if expressed as a percentage of the base, the average rate will decrease
- Unit base = proportional - if the tax base is cars, and the tax amount is constant (R20 per vehicle)
- Income base = regressive - Lizzy earns R2 000 and pays R20 toll. The average rate is 1% (20/2000 X 100). Peter ears R50 000 and also pays R20 toll which translates into an average rate of 0,04% (20/50000 X 100). The average tax rate decreases as the tax base increases.

QUESTION 5 / VRAAG 5

(a) Use a diagram to compare the potential benefits of a government housing subsidy for poor buyers if housing supply is (i) inelastic and (ii) elastic. (1

diagram [4]



- if supply is perfectly inelastic (vertical)
- purchasing power increases
- demand curve shift (D_0 to D_1)
- prices of houses increase
- benefit of subsidy shifted to existing homeowners (capital gains)
- if supply is perfectly elastic (horizontal)
- demand curve shift (D_0 to D_1)
- quantity supplied increases
- price unaffected
- no shifting of benefit

(b) Discuss the median voter hypothesis of Meltzer and Richard and indicate whether it can explain the growth in the share of government in the South African economy. (10)

- majority voting determines magnitude of income redistribution
- median voter important
- if ordered from left to right according to income it is voter in the middle (numerical example)
- if median voter's income < average income pressure for redistribution
- demand for income redistribution increases
- limited by rational voter taking account of disincentive effects
- extension of franchise (SA?)
- substantial redistribution before 1994 – social expenditure
- macro stability required restraint
- distributional goals met by reallocation of social spending

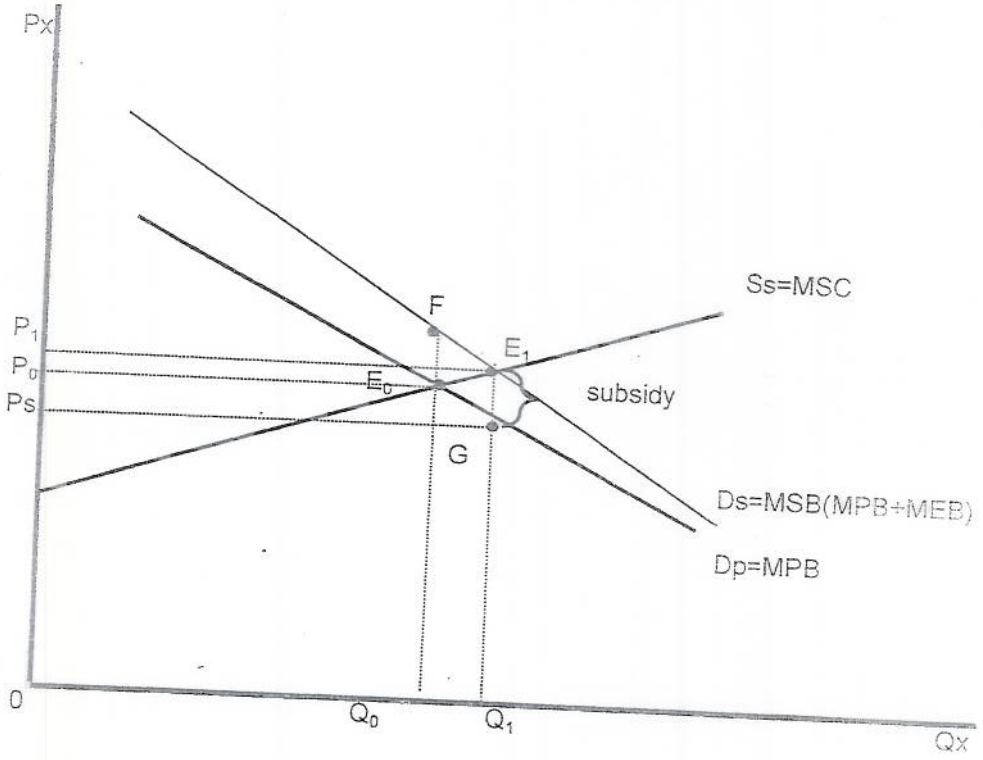
SECTION B / AFDELING B

Answer any **THREE** of the following four questions.

Beantwoord enige **DRIE** van die volgende vier vrae.

QUESTION 4 / VRAAG 4

(a) Analyse, with the aid of a diagram, why government should intervene when a positive externality occurs. Use the same diagram to show how government can internalise the externality. (10)



causes external benefits (MEB)

private equilibrium at E_o ... MSCosts (supply) = MPBenefits (demand)

MSB = MPB + MEB .... at Q_0 the MSB > MPB

social equilibrium at E_1

private equilibrium inefficient (under-provision and under-pricing)

Pigouvian subsidy = GE_1

price paid by consumer = Ps

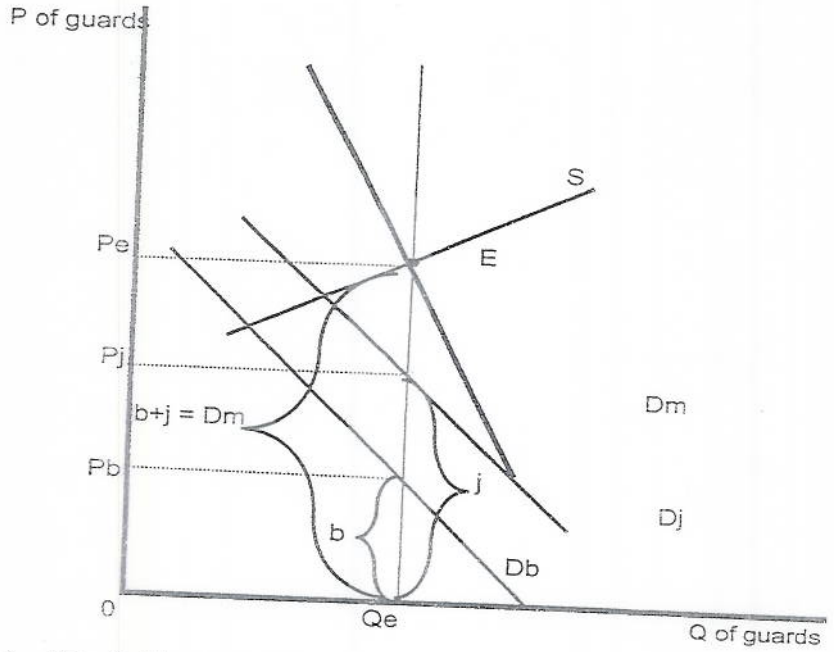
price received by producer = P_1

QUESTION 2 / VRAAG 2

(a) Derive the equilibrium position for public goods with the aid of supply and demand curves. Give one reason why the private sector will not provide public goods at this equilibrium. (10)

- pseudo demand curves (Dj and Db)
- non-excludability
- consumers are price adjusters/quantity takers
- sum of prices = market demand (vertical addition)
- at equilibrium (efficiency rule)
  - quantity the same for b and j
  - efficient pricing rule: Pb + Pj = MC
- market provision? [5]
  - impossible to determine price for extra user (P = MC = 0) [1]
  - incentive to free ride (non-exclusion) ... underprovision

figure [4]



(b) "Redistribution of income is Pareto inefficient." Discuss this statement critically. (5)

- Pareto = redistribution efficient if one person's well-being improves without harming any other
- Negative externality argument – eg crime reduced
- Insurance motive – tax payments better than private insurance
- Altruism – utility a function of own and other person's income

Thursday

Oct/Nov 2009

Ideas

Progressive = T1
Proportional = T
Regressive = T↑

MEMORANDUM

QUESTION 1

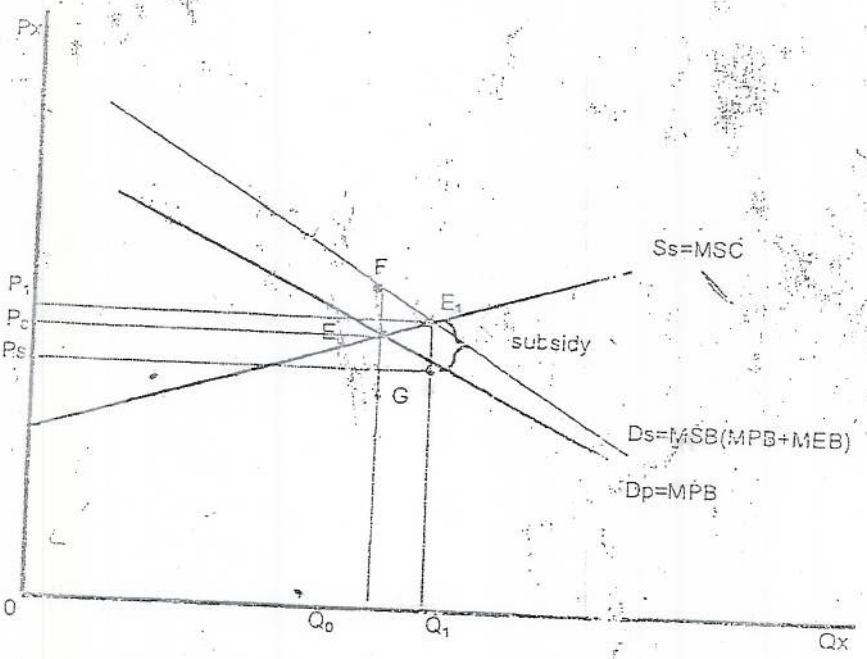
(a) impossible to increase utility (production) of one consumer (firm) without reducing that of the other.
(b) well defined property rights
zero transaction costs
(c) justice in acquisition
justice in transfer
(d) levy high taxes on price inelastic goods and low taxes on price elastic goods
(e) if leisure cannot be taxed the tax is selective and distorts relative prices
(f) the average tax rate decreases at the same rate as the size of the tax base
(g) a congested inter-city road = rival and non-excludable = mixed
justice and correctional services = nonrival and nonexcludable = public

[15]

QUESTION 2

(a) Discuss, with the aid of a diagram, why government should intervene when a positive consumption externality occurs. If a Pigouvian subsidy is used to internalise the externality, what is the efficient subsidy amount per unit and what is the effect on consumer and producer prices?

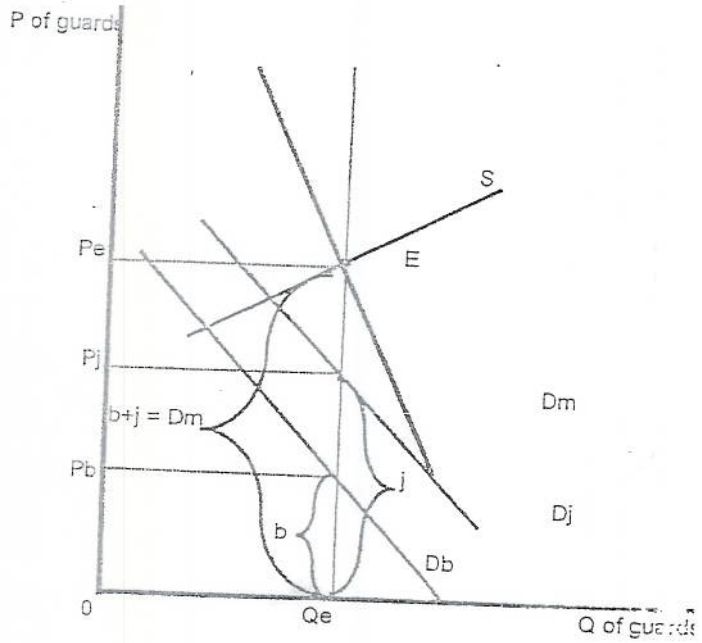
(10)



causes external benefits (MEB)
private equilibrium at E_0 ... MSCosts (supply) = MPBenefits (demand)
MSB = MPB + MEB .... at Q_0 the MSB > MPB
social equilibrium at E_1
private equilibrium inefficient (under-provision and under-pricing)
Pigouvian subsidy = GE_1

Reason Thereof

1



(c) Give two reasons why the private sector will not provide public goods.

- MC = zero or firms cannot make a profit
- free riding

(2)

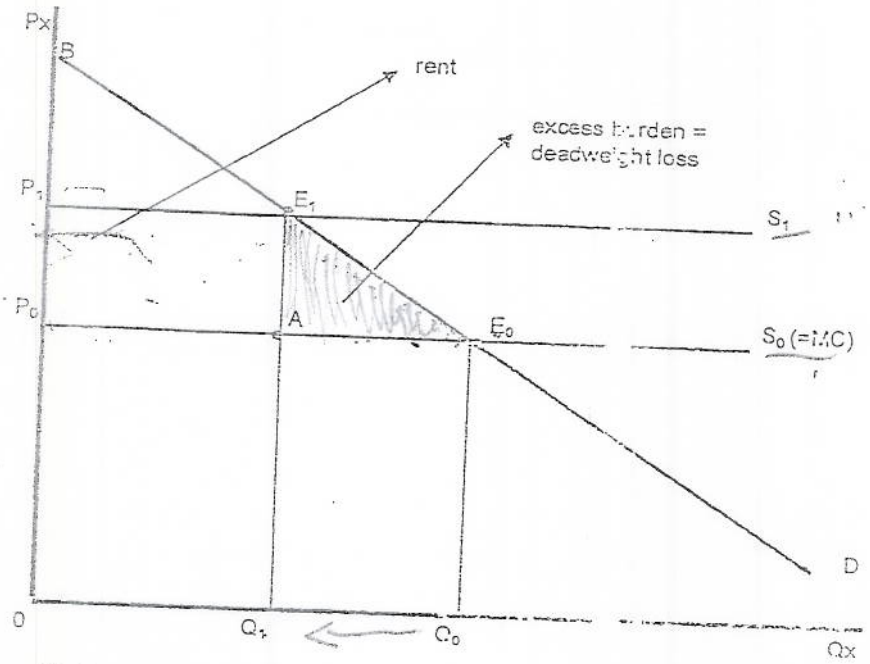
[15]

QUESTION 4

(a) "Taxing only luxury motor cars and exempting all other motor cars from this tax would be inefficient." Do you agree? Explain your answer using indifference curves and budget lines.

Yes

(10)



What is rent? similar to monopoly profits
government creates it (licences, professions)
assume constant returns (=S_0) and demand (=DB) - see fig 6.3
government restricts output to OQ_1... P_1 to P_1
consumer surplus ↓ (= $P_0E_0E_1P_1$ transferred to producers = artificial rent = $P_0AE_1P_1$
AND
deadweight loss = E_1E_0A)...understates loss
What is rent-seeking?... producers will incur costs to capture rent (lobby)
causes MC to shift to maximum of S_1
costs are internal to them (decreases share of rent)
rent-seeking costs would be internal costs (ie lobbying costs) + deadweight loss

(b) Briefly compare the "displacement effect" in Peacock and Wiseman's model to Meltzer and Richard's hypothesis of government expenditure growth. (10)

Peacock and Wiseman's displacement effect
- social upheavals
- government expenditure increases rapidly
- displace certain private and public expenditure
- tax resistance decreases
- after crisis... tax and expenditure levels remain at post-war levels

Meltzer and Richard's median voter model
- median voter NB
- determines which party wins
- if median voter's income < average income
- demand for income redistribution increases
- extension of franchise (SA?)

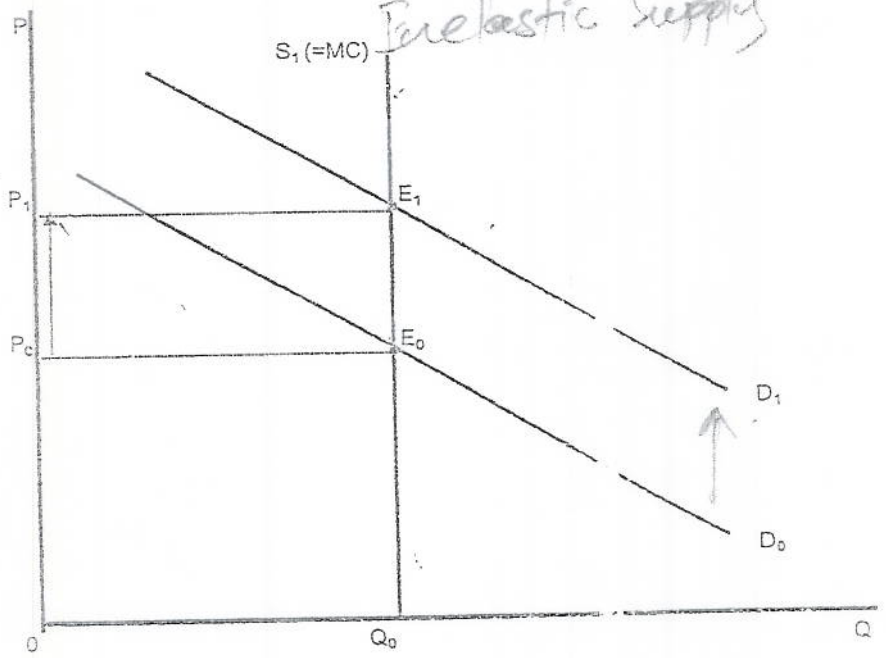
QUESTION 6 [20]

- if economies of scale exists... MC = zero eg road user... preferences not revealed
- limited number of communities... mix of goods inefficient (monopolistic competition)
- redistributional objectives will be avoided by rich

[20]

QUESTION 7

(a) Use a diagram to compare the potential benefits of a government housing subsidy for poor buyers if housing supply is (i) inelastic and (ii) elastic. (10)

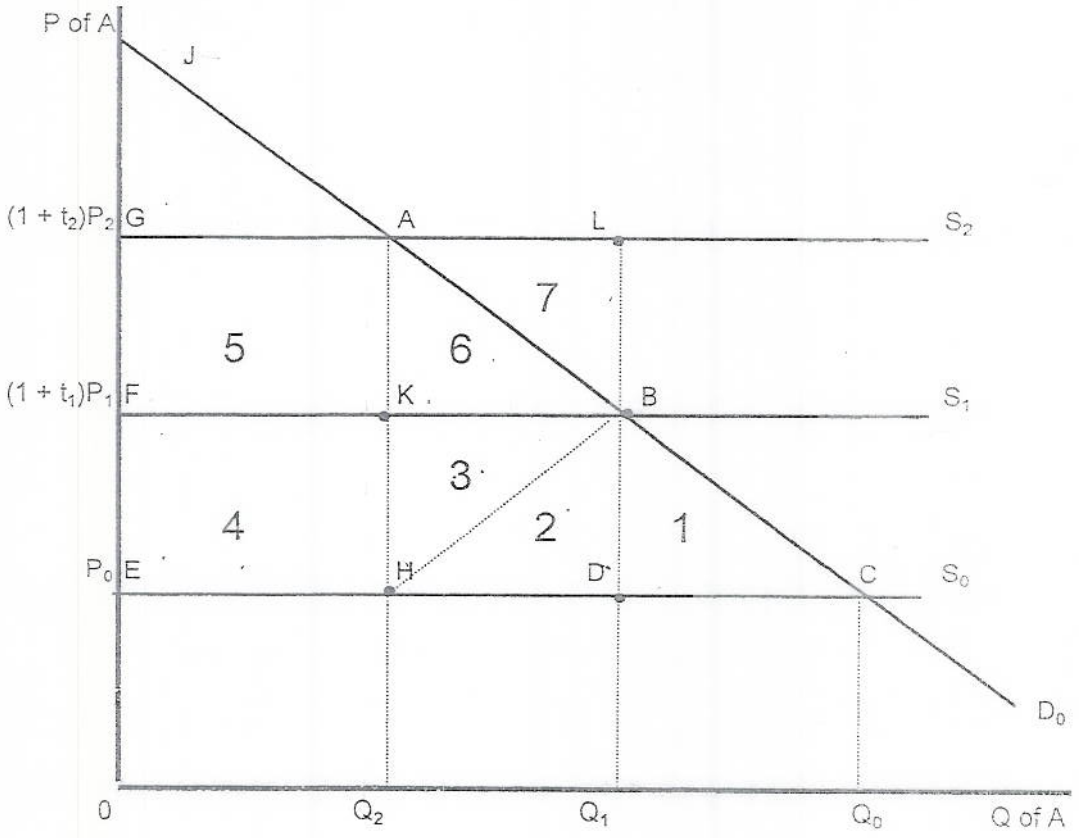


if supply is perfectly inelastic (vertical)...short run
demand curve shift (D_0 to D_1)
price increases... shifting of benefit to existing homeowners (capital gains)

QUESTION 7 / VRAAG 7

(a) Government currently levies a selective tax of t_2 on a good A. Explain using a diagram what the implications are for economic efficiency and government revenue if the tax rate is halved to t_1. Use the consumer surplus approach and assume a horizontal supply curve (the constant-cost industry case).

Diagram (4 marks)



Discussion (6 marks)

- at t_2 tax revenue = 4 + 5 and excess burden = 1 + 2 + 3 + 6
- at t_1 tax revenue = 4 + 3 + 2 and excess burden = 1 + 2 + 3
- excess burden much less and revenue did not halve
- tax at low rate on a broad base
- consumer surplus increased from JAG to JBF

(b) Use a table to compare the key characteristics of public and private goods.

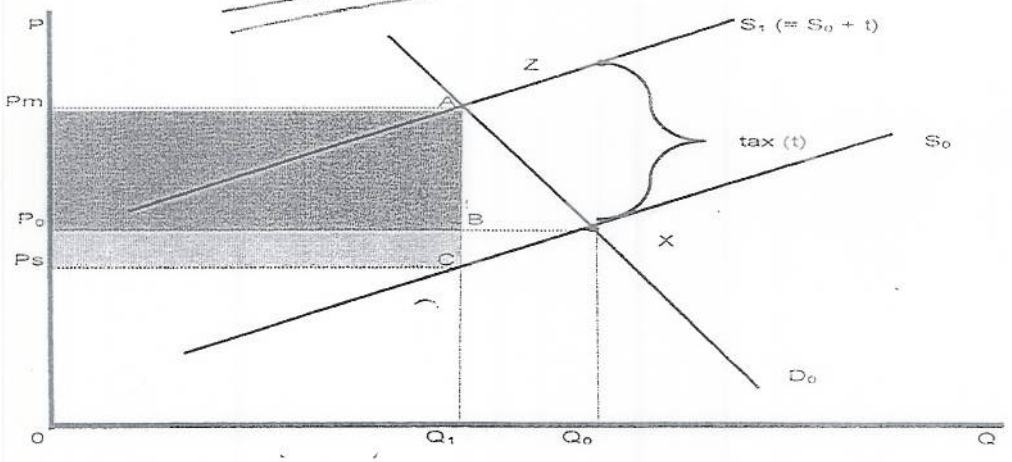
	Public	Private
Property rights	Non-excludable	Excludable
Consumption	Non-rival	Rival
Aggregate demand curve	Vertical addition of P	Horizontal addition of Q
Equilibrium	$\sum MU = MC$	MU = MC
Pricing rule	$\sum P = MC$	P = MC

QUESTION 5 / VRAAG 5

Fig 10.1

(a) Analyse, with the aid of a diagram, the tax incidence of a unit tax levied on the suppliers of bread. (Assume a 'normal' supply curve that increases from left to right.)

to inelastic demand



Impose unit tax on **suppliers** at P_0 and Q_0

1 Sellers add tax at each quantity
eg at Q_0 ...P_0 + tax... point Z on new supply curve

2 Effective **supply curve shifts parallel** (S_0 to S_1)

3 At new equilibrium A (P_m and Q_1):

price paid by buyers = P_m = market price
price received by sellers = P_m - tax
= P_s
total tax burden (revenue) = P_mACP_s
share of buyers... P_0 to P_m = P_mABP_0
share of seller... P_0 to P_s = P_0BCP_s

- Tax burden split between consumers and suppliers
- Consumers pay largest part of tax because demand is inelastic

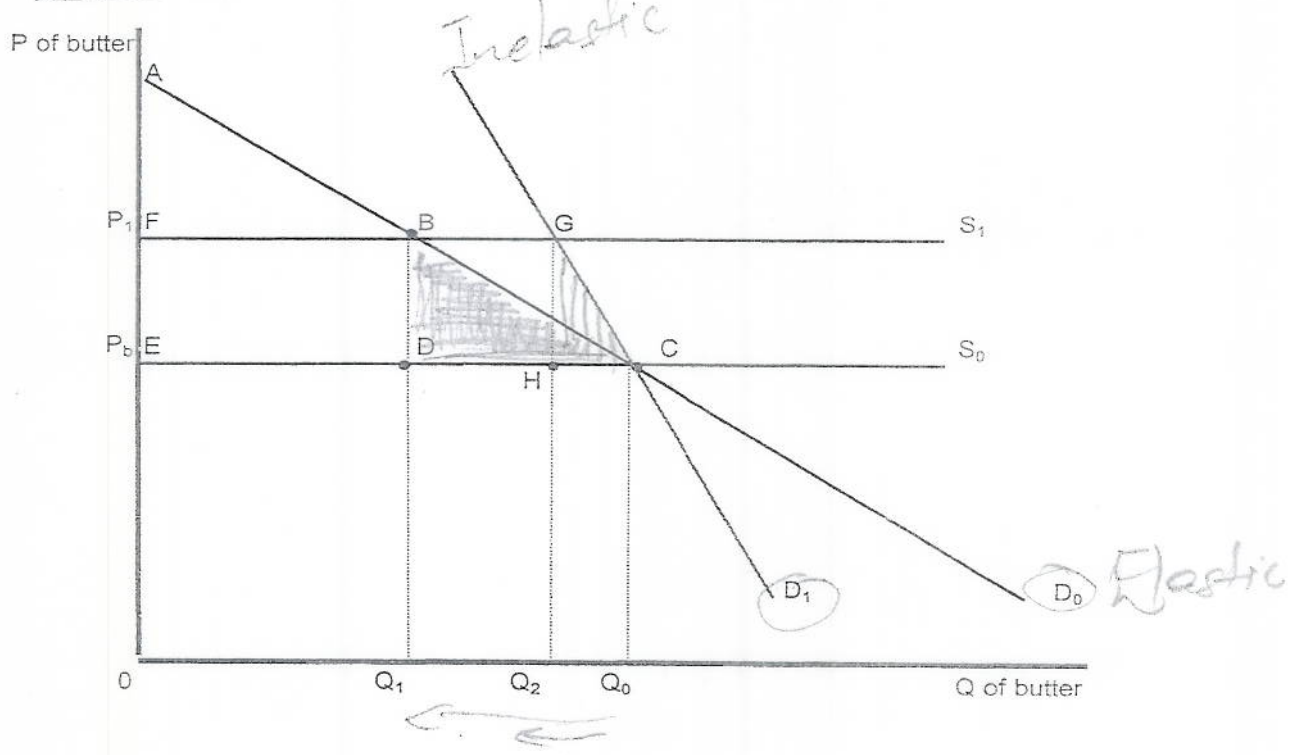
(b) Discuss the assignment of spending responsibilities to national and sub-national governments. (Use the three broad economic functions of government as a point of departure.)

- stabilisation
  - ➢ monetary policy and fiscal policy a central government function
  - ➢ open economies ... expansionary policy... benefits to other regions
  - ➢ printing of money to finance expenditure?
- allocation (central and provincial and local – public goods... national or local)
  - ➢ static
    - accommodates diversity of tastes (regional gov)
    - spatial characteristics of public goods
    - lower-tiers have more information on needs
    - diseconomies of scale if bureaucracy or region is too large
  - ➢ dynamic
    - decentralisation stimulates innovation
    - capacity at local level?
- redistributive
  - ➢ central government function... eg higher taxes... mobile labour exits

QUESTION 4 / VRAAG 4

(a) The size of the excess burden of a tax on a commodity (supplied by a constant-cost industry) is affected by price elasticity of demand. Use a diagram to derive a tax rule that will maximise efficiency and tax revenue.

- Demand D_0 is more elastic than D_1
- Assuming constant returns the supply is S_0
- Impose selective tax and supply shifts to S_1
- In the case of (price) sensitive demand curve D_0 quantity demanded decreases to Q_1 and for the (more) insensitive demand curve D_1 it decreases to Q_2
- The excess burdens are BCD (for D_0) and GCH (for D_1)
- Where demand is inelastic the excess burden is less for the same tax rate change – (economically) more efficient
- The government revenue for D_0 is FBDE and for D_1 it is FGHE
- From an efficiency and revenue perspective it is again better to tax price inelastic commodities.



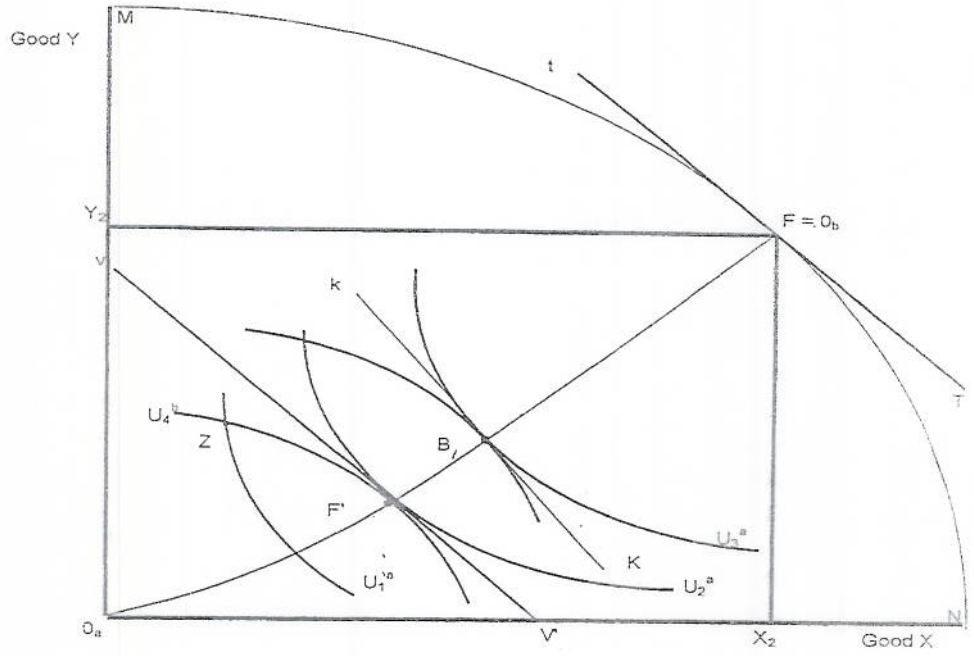
QUESTION 2 / VRAAG 2

(a) Describe **only** Condition 3 (top-level simultaneous equilibrium) of the benchmark model of resource allocation as follows:

(i) Provide the mathematical equation that summarises this condition.
(ii) Illustrate the equation in (i) by means of a diagram **only**.
(iii) At what point(s) in your diagram is a Pareto-optimal top-level equilibrium achieved? Why is that a Pareto-optimal equilibrium?

(i) $$MRPT_{xy} = \frac{MCx}{MCy} = \frac{Px}{Py} = MRS^{a}{}_{xy} = MRS^{b}{}_{xy}$$

(ii) Diagram: [5]



(iii)

- F or F'
- Impossible to increase utility of A or production of X without decreasing utility of B or production of Y.

(b) Briefly discuss the policy options government could use to correct inefficiencies caused by an "artificial" (or statutory) monopoly.

1 deregulation (remove barriers to entry)
2 do nothing (long term... D curve becomes flatter)... markets are contestable
3 tax policy
- income tax - no allocation effect.... (profits)
- unit tax - shift AC and MC up... Q↓ & p↑
- lump-sum tax - AC shift up no allocation effect
4 price control (P = MC)... how is MC measured?

QUESTION 1 / VRAAG 1

(a) Distinguish between direct and indirect government intervention. (2

- direct = actual participation in economy (eg produce, tax individuals)
- indirect = regulatoryfunction (eg labour laws, competition policy)

(b) The Coase theorem regarding the treatment of externalities is based on two assumptions. Which are these assumptions? (2)

- well defined property rights
- zero transaction costs

(c) Identify three sources of government failure. (3)

- politicians persuing vote-max strategies
- bureaucrats maximising budgets
- interest groups engaging in rent-seeking

(d) Distinguish between a selective tax and a general tax. (2)

- selective = narrow base and distort relative prices
- general = broad base and relative prices unchanged

(e) What are the differences between partial and general equilibrium analysis when tax incidence is investigated? (2)

- partial = impact on single market or product – other prices unchanged
- general = secondary effects on inputs and commodity markets considered

(f) What is meant by tax progressivity? (2)

- the average tax rate increases as the size of the tax base increases

(g) Define a local public good. (2)

- benefits confined to limited geographical area (eg recreational park)

(5)

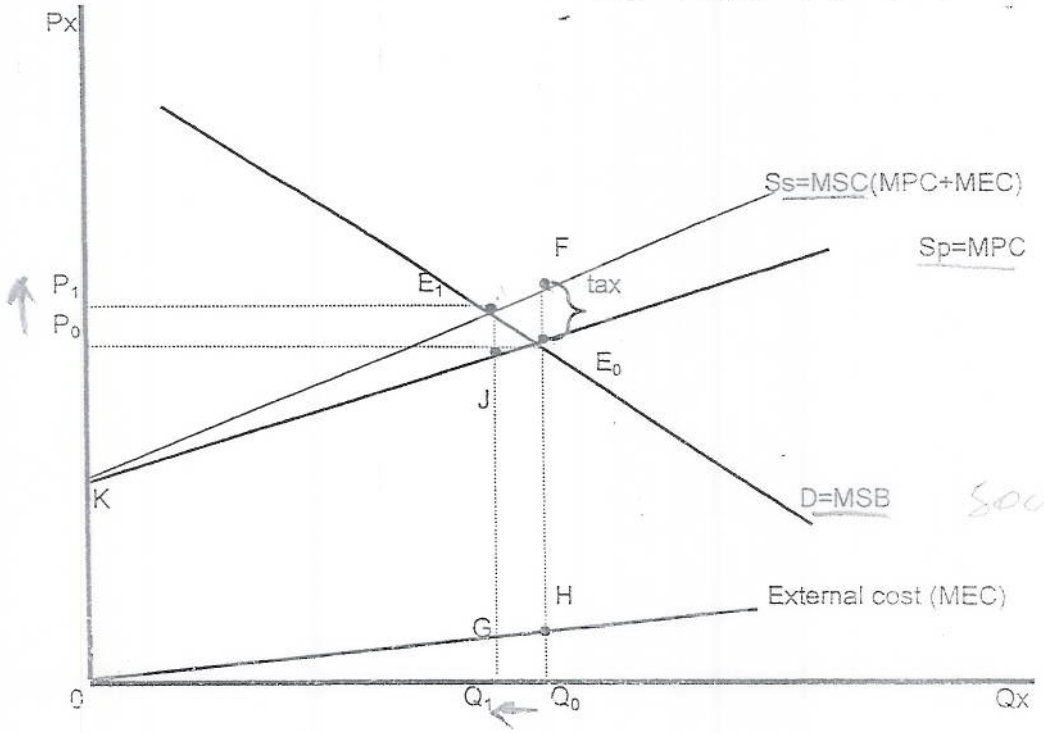
study unit 2

QUESTION 3 / VRAAG 3

(a) Discuss with the aid of a diagram, why government should intervene when a factory producing paper pulp causes a negative externality (e.g. pollution). (10)

- causes external costs (MEC) = area KE_0F
- private equilibrium at E_0 ... MPCosts (supply) = MPBenefits (demand)
- MSC = MPC + MEC
- MSC > MPC
- social equilibrium at E_1
- external costs = KJE_1
- private equilibrium inefficient (over-provision and under-pricing)

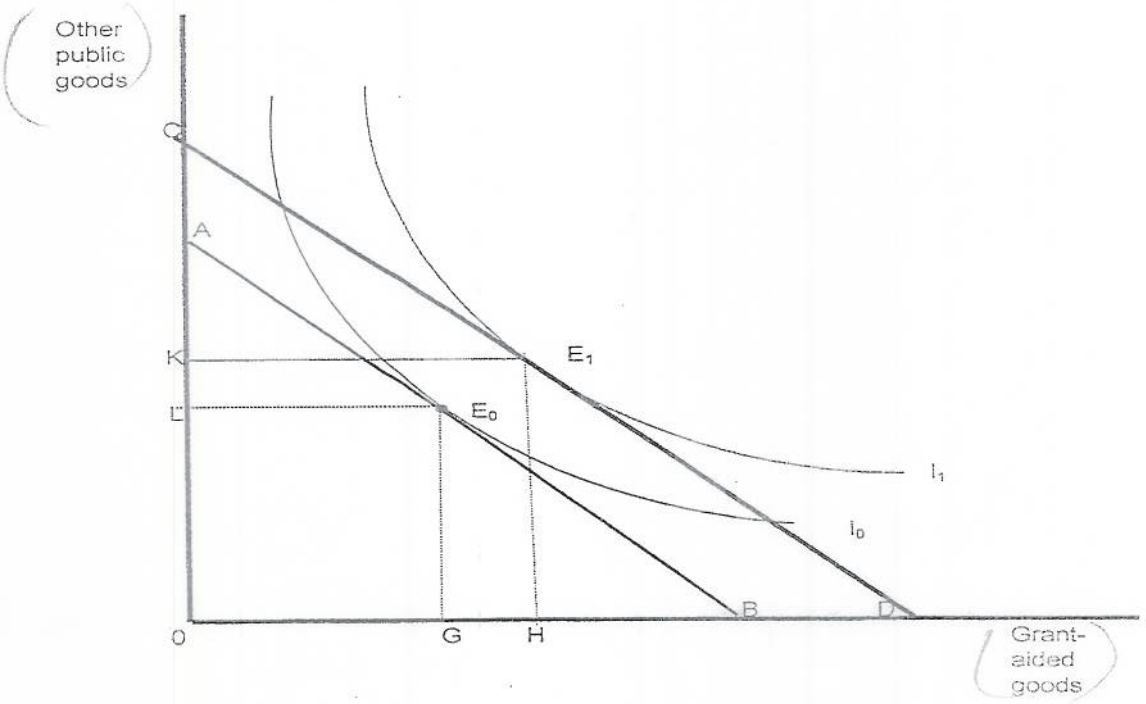
Diagram (5 marks)



(b) Using the diagram in (a), explain how allocative efficiency in the production of paper pulp can be promoted using a Pigouvian tax. (5

- **supply (cost) curve** shifts to Ss
- levy tax = MEC eg (= E_0F)
- at output of Q_0 ... MPC + tax > benefits or demand (ie average revenue) and production/consumption is reduced to Q_1
- information constraints! costs... size... slopes

(b) Draw a diagram to illustrate the impact of an unconditional nonmatching intergovernmental grant. Give one reason why national government would make such a transfer to other levels of government. (5



- address fiscal imbalances (horizontal and vertical) between sub-national governments known as revenue sharing

SECTION B / AFDELING B

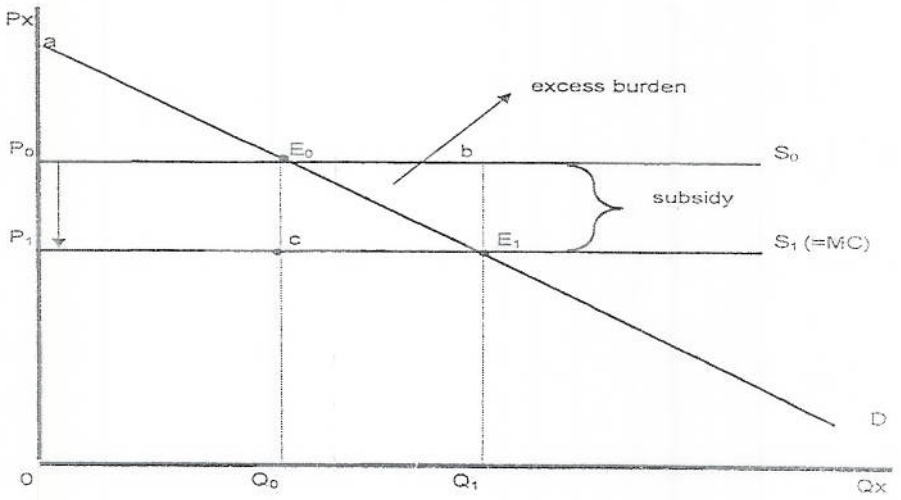
Answer any TWO of the following four questions.

Beantwoord enige TWEE van die volgende vier vrae.

QUESTION 6 / VRAAG 6

(a) "A bread price subsidy to benefit the poor is economically inefficient." Discuss this statement using a diagram. (Assume constant production costs.) (1(

- producer subsidy lowers price (...compare to tax) and quantity supplied/demanded increases to Q_1
- consumer surplus increases by $P_0E_0E_1P_1$
- due to lower price = $P_0E_0cP_1$
- due to extra Q purchased = E_0E_1c
- cost of subsidy = $P_0bE_1P_1$
- excess burden = E_0bE_1 (diagram = 4)



(b) Discuss Baumol's unbalanced productivity growth model (a micro explanation) of public expenditure growth. (1(

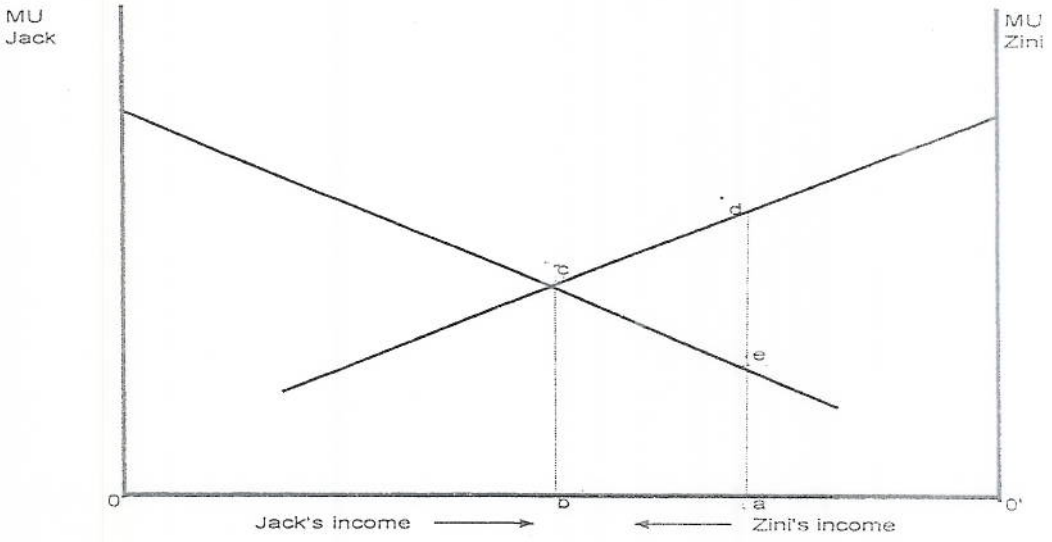
- Baumol divides economy into **progressive sector** and **non-progressive sector**
- Progressive sector: technological activities e.g. innovation, capital formation & economies of scale – all contribute to rise in level of output
- cumulative increase in productivity of employees, justifies increases in salaries
- Non-progressive sector: permit sporadic changes in productivity
- Labour is only one of the inputs in progressive sector; in non-progressive sector often the end product
- In non-progressive sector a limit to productivity increases – largely determined by labour-intensive nature of the service. N-p sector usually consists of services. Applies especially to public sector – labour important – e.g. education, law & order
- Technological changes have smaller effect on productivity in n-p sector. Only sporadic improvements in productivity in n-p sector compared to relatively rapid increases in progressive sector
- Wages & salaries in both sectors need to move together to prevent labour leaving n-p for progressive sector
- This raises relative costs of the n-p sector, because salary increases are not accompanied by same increases in productivity as in the progressive sector.
- Baumol may have underestimated the opportunities for technological advancement in the public sector OR Not tested empirically in RSA

QUESTION 8/VRAAG 8

(a) Using a Bergson cardinal additive welfare function and a diagram, explain how income redistribution may lead to the maximising of social welfare. Discuss one of the assumptions of this theory critically. (1

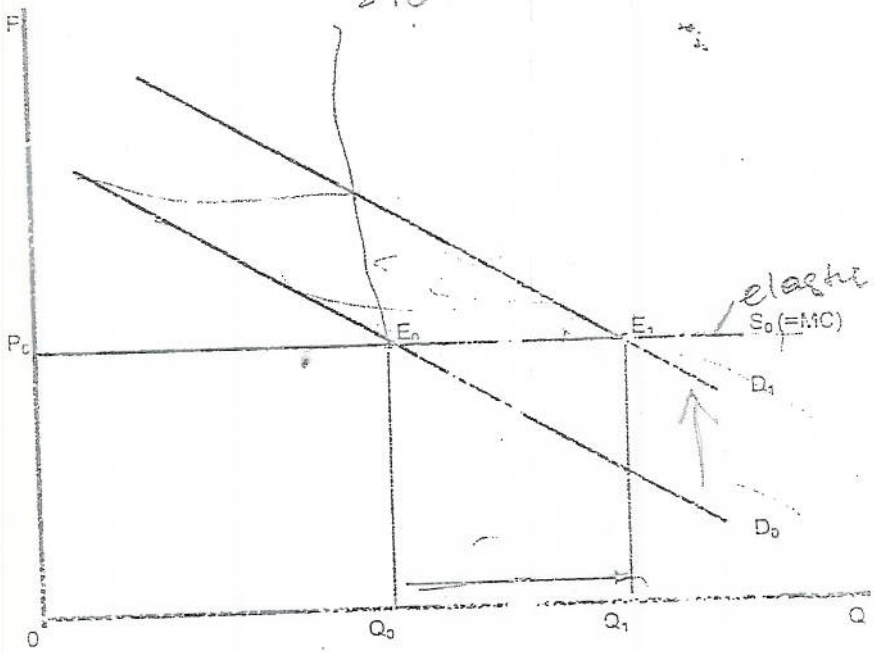
- Welfare = f (U_a + U_b +...) ... net effect
- area under MU curve measures total utility
- if income is redistributed from Jack to Zini
- Zini total utility increases with BCDE and Jack's utility decreases with CEAB
- net increase in total utility = CDE
- requires an equal distribution of income [4]
- Assumes [2]
  (1) utility measurable
  (2) individuals have same utility functions ...income only
  (3) MU ↓ as income increases
  (4) total income is fixed

diagram [4]



(b) "The excess burden is not the only cost of a tax. Taxes also have to be administered." Explain the meaning of administrative efficiency. Also discuss the issues that need to be considered when taxes are evaluated from an administrative efficiency perspective. (1

- admin costs borne by government
- compliance costs borne by taxpayer
- efficiency = minimising admin and compliance costs
- efficient taxes also minimises tax avoidance (legal) and tax evasion
- issues:
  - level of taxpayer literacy
  - admin expertise
  - tax morality
  - political will to enforce laws
  - certainty (predictability) and transparency required
  - little discretion in deciding what and who bears burden
  - tax decision subjected to political decision-making process



if supply is perfectly elastic (horizontal)...long run
demand curve shift (D_0 to D_1)
price unaffected... no shifting of benefit

(b) Consider an increase in personal income tax rates.

(i) Explain what are the likely effects on the supply of labour? (Do not use a diagram). (5)

income effect
- increases labour supply
- work more to compensate for loss in income

substitution effect
- decreases labour supply
- choice between work and leisure
- price of leisure = wage (w)
- income tax reduces net wage (leisure becomes cheaper)
- "buy" more leisure.... work effort reduced.

(ii) What empirical evidence is available to support your views in (i)? (2)

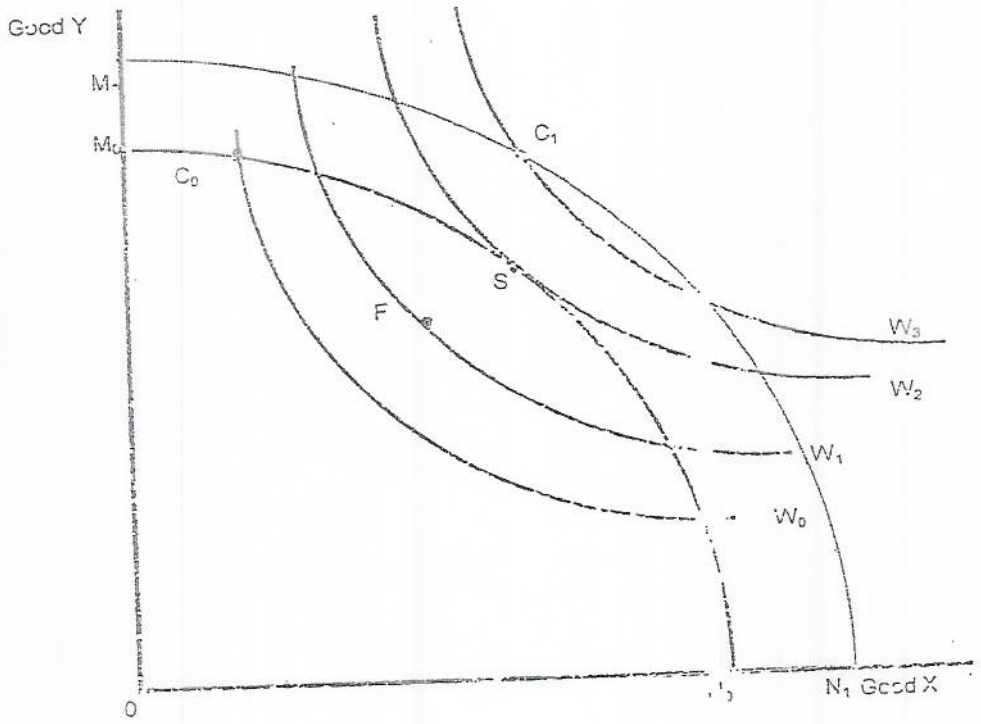
- labour supply of men inelastic
- labour supply of married women elastic

(iii) According to Laffer, what is the potential impact on tax revenue? (Do not use a diagram). (3)

- high tax rates – substitution effect dominates (work less)
- tax base reduced
- tax revenue decreases (product of rate and base)

[20]

(a) Use production possibility curves and social indifference curves to illustrate and explain the disincentive and savings effects of income and wealth redistribution. (10)



Equity ≠ efficiency (C_0 vs S in fig where C_0 is allocative efficient point)
Redistribution improves equity but at cost of efficiency (ie trade-off)
Sub-optimal allocation inside PPC (point F)...
how is S reached?... subsidies, taxes but
redistribution effects efficiency via incentive to work.
income & substitution effects... point F... inefficient but level of welfare ↑ (W_1 vs W_3)
restraint on dynamic efficiency (allocation outside PPC) (point C_1)
incentive to save and invest.... without tax distortion... PPC shifts and C_1 is on W_3

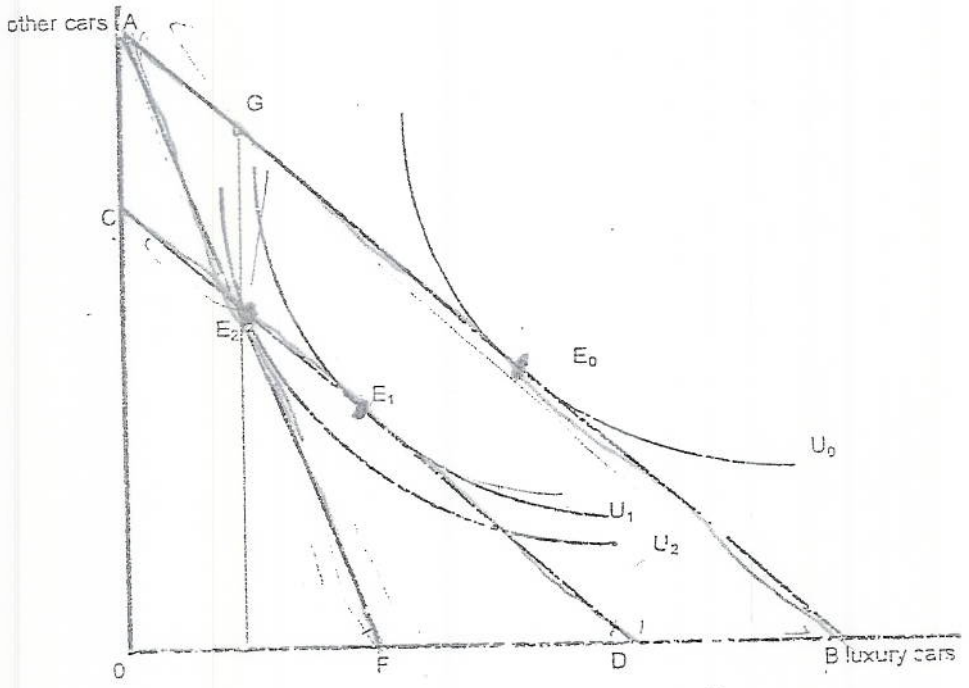
(b) Critically discuss the assumptions and main arguments of the Tiebout model (10)

Fiscal Federalism

large enough number of local authorities
offer different mix of services and taxes
choice of location reveals preference for public goods
allocative efficiency (preferences revealed through voting with one's feet)
competing local authorities limit revenue-maximising behaviour
assumptions
- citizens are mobile
- full information
- large number of local authorities
- no geographic employment restrictions
- no spillovers
- no economies of scale in provision

criticism

only luxury cars and exempting all other motor car from this tax
the inefficient do you agree? Explain your answer using indifference curves
budget lines



selective tax on luxury cars... distorts relative prices
budget line pivots (AB to AF)
by comparing a neutral tax to selective tax which generates same tax revenue (GE_2)...
neutral tax e.g. lump-sum tax (general tax on other cars and luxury cars)
parallel shift of budget line (AB to CD)
excess burden is shown by welfare/utility differences (U_1 versus U_2) U_1 vs U_2

(b) Distinguish between tax evasion and tax avoidance. Give examples of each. How can these phenomena be minimised? (5)

evasion – illegal (under-reporting of income)
avoidance – legal (loopholes)
simplification, high penalties

[15]

SECTION B

Answer any TWO of the following four questions.

QUESTION 5

(a) Explain and illustrate the consequences of rent-seeking under competitive conditions. (10)

price paid by consumer = Ps
price received by producer = P_1

(b) Briefly discuss two policy options government could use to correct inefficiencies caused by an "artificial" monopoly. (5)

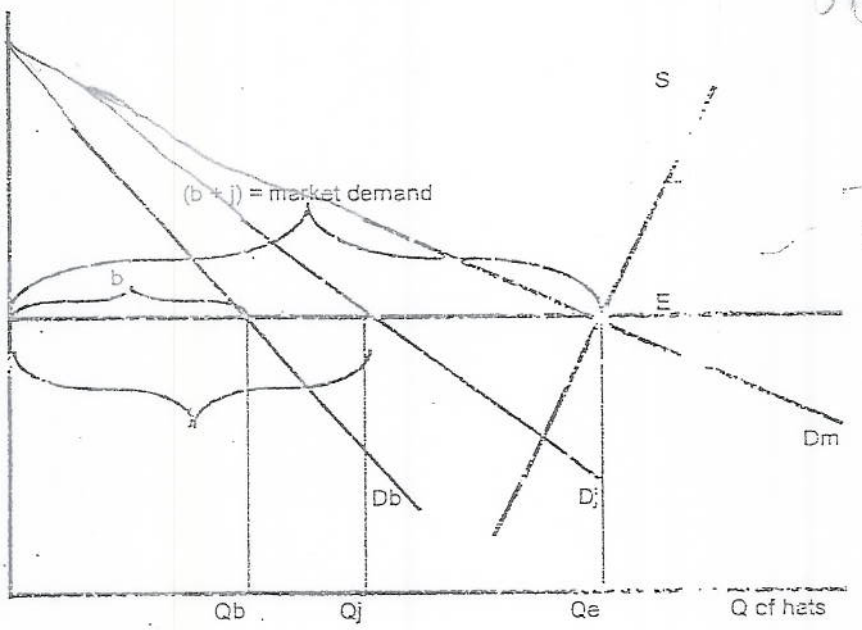
1 deregulation (remove barriers to entry)
2 do nothing (long term... D curve becomes flatter)... markets are contestable
3 tax policy
- income tax - no allocation effect.... (profits)
- unit tax - shift AC and MC up... Q↓ & p↑
- lump-sum tax - AC shift up no allocation effect

4 price control (P = MC)... how is MC measured?

[15]

QUESTION 3

(a) Derive the equilibrium position for private goods with the aid of supply and demand curves. (10)



market demand... consumers are price takers/quantity adjusters
sum of quantities = market demand (horizontal addition)
at equilibrium (efficiency rule)
- condition for provision: MUb = MUj = MC (area under demand curve measures utility)
- efficient pricing rule: P = MC

(b) Use a diagram to illustrate how the equilibrium for a public good differs from that of a private good (3)