

EX/UG/Eco/Core 5.2/2025

BACHELOR OF ARTS EXAMINATION, 2025

(3rd Year, 1st Semester)

ECONOMICS

Course : ECO/CORE 5.2

(Public Economics)

Time : Two Hours

Full Marks : 30

GROUP—A

Answer the following questions.

- 1.** Classify the following as either a public good, a private good, a common-pool resource or a club good :

(i) A congested highway

(ii) A national park

(iii) A pay-TV service

Briefly justify your classification for each. 3

- 2.** Education is often viewed as a good with positive externalities. Explain how education might produce positive external effects. 2

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[Turn Over]

(2)
GROUP—B

Answer *any two* questions. 4×2=8

3. Define pure public good. Explain the concepts of non-excludability and non-rivalry. Explain why the existence of pure public goods leads to market failure. 1+1+2=4
4. Explain the concept of the Coase Theorem. What are the key assumptions of the theorem? Under what conditions does the Coase Theorem predict that a market will achieve an efficient outcome regardless of the initial allocation of property rights? 1+2+1=4
5. Define deadweight loss in the context of commodity taxation. Explain the factors that influence the magnitude of the deadweight loss, providing a clear diagram to illustrate your answer. 1+1+2=4

GROUP—C

Answer *any two* questions. 4×2=8

6. Consider a market with a linear demand curve $x = 100 - 2p$ and a perfectly elastic supply curve at price $p = 10$. A specific tax of $t = 5$ is imposed.
- (a) Calculate the equilibrium price and quantity before and after the tax.
- (b) Calculate the deadweight loss resulting from the tax.
- (c) Calculate the tax revenue collected by the Government. 1+2+1=4

(5)

[Note :

For each tax system, clearly show your calculations of :

- (i) The household's optimal hours of work (H) and leisure (L).
- (ii) The level of consumption (C).
- (iii) The level of utility (U).
- (iv) Briefly explain the effect of the tax on the supply of labour.]
10. (a) Discuss the wealth and substitution effects of taxation on savings in detail, considering both the cases where individuals are net lenders and the case where they are net borrowers.
- (b) Using the concepts of elasticity of substitution and wealth elasticity of consumption, explain under what circumstances taxes will encourage or discourage saving.
- (c) Lisa is considering two savings accounts. Account A offers a 4% interest rate and is taxed at 20%. Account B offers a 3% interest rate but is tax-exempt. If she invests \$5,000 in each account for one year, which account will yield a higher after-tax return? 3+3+3=9

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(3)

7. Consider a factory polluting a river. The factory's Marginal Private Cost (MPC) of production is given by $MPC = 2q$, where q is the quantity produced. The Marginal External Cost (MEC) imposed on a downstream fishery is $MEC = q$. The Marginal Social Cost (MSC) is therefore $MSC = MPC + MEC = 3q$. The demand for the factory's product is given by $p = 20 - q$.

(a) Calculate the equilibrium quantity and price in the absence of any Government intervention.

(b) Calculate the socially optimal level of production (where marginal social cost equals demand).

(c) What level of Pigouvian tax would achieve the social optimum? 1+1+2=4

8. Consider a scenario with two consumers. Each has an income of \$100 and must allocate their income between a private good (price = \$1) and a public good (price = \$1). Their utility functions are $U = x + G$ and $U = 2x + G$, where x_i represents the quantity of the private good and G represents the total amount of the public good provided.

Find the possible quantities of the private and public goods that would be consumed in the Nash equilibrium solutions. Explain why this outcome is not Pareto efficient. 1+1+2=4

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[Turn Over]

(4)

GROUP—D

Answer *any one* question.

1×9=9

9. A household derives utility from consumption (C) and leisure (L) according to the following utility function :

$$U(C, L) = CL$$

The household has a total of 24 hours per day ($T = 24$) available to allocate between work (H) and leisure (L), where $H + L = 24$. The wage rate (w) is \$20 per hour. There is no non-wage income. The household's budget constraint without taxes is $C = wH$.

The Government needs to raise \$240 in revenue. Analyse the impact on the household's labour supply (H) and utility (U) under the following three tax systems :

(a) A lump-sum tax of \$240

(b) A proportional income tax that yields \$240 in revenue

(c) A progressive income tax that yields \$240 in revenue. Assume this tax has two brackets : 0% on the first \$120 of income and 100% on all income above \$120

(d) Compare the outcomes under the three tax systems. What are the key differences? Discuss the relative impacts of income and substitution effects in each case (use diagram). 1+2+2+4=9

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