1.23 Public Goods and the Free-Rider Problem

AQA 7136 · Calculators not allowed · about 50 minutes · Write-in edition

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer all questions. Full sentences are required for questions worth 3 marks or more and for the 12-mark question. Time guidance: 50 minutes for the whole pack.

1 Define the economic term 'non-rivalry' in the context of a public good, with reference to street lighting in a UK town.

(Total for Question 1 is 2 marks)

2 Define the free-rider problem in the context of public goods, using the example of a national vaccination programme where herd immunity benefits all residents.

(Total for Question 2 is 2 marks)

3 State two possible limitations or problems with government provision of public goods financed by taxation, briefly explaining each in the context of provision of free-to-access public parks.

(Total for Question 3 is 3 marks)

4 Explain, in two brief points, how the marginal cost and marginal benefit concepts help justify state provision of a public good such as national defence.

(Total for Question 4 is 2 marks)

5 Analyse why the free market is likely to fail to provide national defence for a country the size of the United Kingdom. In your answer explain non-excludability, non-rivalry and the free-rider problem, and evaluate any private or quasi-market mechanisms that might partially address under-provision.

(Total for Question 5 is 12 marks)

6 Explain, with one short example, why a private firm may under-provide street lighting if left to the market, referring to the free-rider problem.

(Total for Question 6 is 3 marks)

7 State two reasons why private markets are unlikely to supply national defence in the required quantity for a country like the UK.

(Total for Question 7 is 2 marks)

8 Explain, with an example, how government provision financed by taxation can solve the under-provision of a public good such as lighthouses for shipping safety.

(Total for Question 8 is 3 marks)

9 State whether the following statements are true or false and give a one sentence justification for each in the context of public goods: (a) 'All excludable goods are private goods', (b) 'A good can be non-excludable but rival'.

(Total for Question 9 is 3 marks)

Mark scheme · 1.23 Public Goods and the Free-Rider Problem

Question 1

a statement that non-rivalry means one person's use of the good does not reduce its availability to others	**B1**
example link: one person benefiting from street lighting does not prevent others from also benefiting	**B1**

Answer: Non-rivalry means one person's consumption does not reduce what is available for others; for street lighting, one pedestrian using the light does not stop another pedestrian from also benefiting.

Question 2

a statement that the free-rider problem is where individuals benefit from a good without paying for it	**B1**
example link: people who refuse vaccination still receive protection from herd immunity provided by others	**B1**

Answer: The free-rider problem is when people benefit from a good without contributing to its cost; for example, someone who does not get vaccinated still gains some protection from others through herd immunity.

Question 3

identifies a limitation, e.g. government may provide at inefficient scale due to political pressures rather than cost-benefit	**B1**
explains it in context: a council might over-invest in park amenities to win votes rather than reflect actual public demand	**B1**
identifies and explains a second limitation, e.g. taxation creates deadweight loss or distortion, reducing economic efficiency and possibly crowding out private provision	**B1**

Answer: Governments may provide at an inefficient scale due to political motives, for example over-investing in park features for popularity, and taxation to finance parks can create economic distortions or deadweight loss, reducing overall efficiency and potentially crowding out private alternatives.

Question 4

point that marginal cost of providing the public good to an additional user is near zero for non-rival goods, so private pricing at marginal cost would not cover fixed costs	**M1**
point that the marginal social benefit exceeds the marginal private benefit because everyone benefits, justifying collective provision financed by taxation	**M1**

Answer: Marginal cost of serving an additional beneficiary is near zero for non-rival goods so private marginal-cost pricing would not recoup fixed costs, and marginal social benefit exceeds marginal private benefit because the whole population gains, so collective provision funded by taxation can achieve the socially optimal provision.

Question 5

Level 1 Basic analysis: identifies one or two relevant features of public goods such as non-excludability or the free-rider problem with limited explanation and little contextual development. Little or no evaluation of private/quasi-market responses. **1-4**

Level 2 Clear analysis: explains how non-excludability and non-rivalry lead to the free-rider problem and under-provision by private markets, with some application to the context of national defence. May suggest plausible private or quasi-market responses and discuss their limitations. **5-8**

Level 3 Thorough analysis and evaluation: well developed explanation of why private markets fail for national defence, including clear use of non-excludability, non-rivalry and free-rider logic, assessment of magnitude and practicalities, and evaluation of private/quasi-market mechanisms with reasoned judgement supported by UK-style examples. **9-12**

Indicative content:

- Non-excludability: national defence cannot exclude non-payers, so private firms cannot ensure only paying individuals receive protection, creating weak incentives to pay and deterring private provision.
- Non-rivalry: one person gaining protection does not reduce the protection available to others, so marginal cost of serving an additional person is near zero and charging per user is impractical for cost recovery.
- Free-rider problem: individuals have incentive to withhold payment and rely on others, so voluntary contributions under-provide relative to social optimum.
- Public-goods market failure: private provision would either be too little or absent; provision requires covering large fixed costs of armed forces, equipment and intelligence which private voluntary payments will not finance.
- Quasi-market mechanisms: examples include subscription services for private security, alliances, insurance-based approaches, or targeted premiums for certain benefits; discussion of why these are limited for national defence because threats are collective, border-crossing and not excludable.
- Evaluation of taxation provision: collective financing via taxation overcomes free-rider problem but raises questions about optimal level, efficiency costs of taxation, political economy influences and potential over- or under-provision due to political motives.
- Practicalities and magnitude: scale of defence, deterrence value, public goods spillovers to trade and investment, and benefits that are hard to price; time horizon and irreversibility of defence investment.
- Judgement: balanced conclusion weighing the theoretical failure of markets against the limited role of private mechanisms and the pragmatic necessity of public provision via the state for national defence.

Question 6

identifies the free-rider problem: individuals can benefit without paying **M1**

explains consequence: firms cannot easily charge every beneficiary, reducing incentives to provide the good **M1**

gives a concrete example: a private firm cannot prevent nearby residents from using public street lights, so it cannot recoup costs through charging and will under-provide or not supply them **A1**

Answer: Because street lighting is non-excludable, people can free-ride by using the light without paying; private firms cannot charge all beneficiaries so they cannot recoup costs, for example a firm lighting a street could not stop neighbours benefiting and therefore would under-provide or not install lighting.

Question 7

non-excludability means providers cannot prevent non-payers from benefiting, so they cannot ensure payment **B1**

non-rivalry means marginal cost of adding another beneficiary is zero, making it hard to charge per user and recoup fixed costs **B1**

Answer: Non-excludability prevents excluding non-payers so payment cannot be enforced; non-rivalry means marginal cost per additional beneficiary is near zero, so charging per user is impractical and firms cannot cover fixed costs.

Question 8

identifies that government can fund provision using general taxation to cover fixed costs **M1**

explains that taxation overcomes the free-rider problem by forcing payment from taxpayers who all benefit **M1**

gives example: a government funds coastal lighthouses from tax revenue so ships benefit even if individual owners would not pay voluntarily **A1**

Answer: The government can fund lighthouses using general taxation, covering fixed costs and solving the free-rider problem since taxpayers pay and all ships gain the safety benefit even if individual shipowners would not voluntarily pay.

Question 9

(a) false, justification: excludability alone does not determine rivalry, so a good can be excludable yet non-rival (quasi-public) or excludable and rival (private) **B1**

(b) true, justification: example such as a public park that is non-excludable but can be rival when crowded **B1**

each justification links the truth value to the definitions of excludability and rivalry **B1**

Answer: (a) False: excludability alone does not make a good private. (b) True: some goods can be non-excludable but rival, for example a park that becomes crowded.