

NATIONAL UNIVERSITY OF LESOTHO
BURP SUPPLEMENTARY EXAMINATIONS
GES4585 INFRASTRUCTURE PLANNING

AUGUST 2023

Marks: 100

TIME: 3 HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

QUESTION 1

Write an essay that demonstrates the historical impact of innovations in infrastructure technology on the development of human settlements **[25]**

QUESTION 2

Using a hypothetical illustration of an infrastructure facility of your choice (think water treatment plant, solid waste disposal facility, electricity power station, sports complex, recreational park), explain the following categories of benefits and costs in Cost-Benefit Analysis (CBA) and how they might be measured:

- i) Internal vs. external benefits and costs (10)
- ii) Tangible vs. intangible benefits and costs (15)[25]

QUESTION 3

Provide a comprehensive explanation that shows how cost-benefit analysis is associated with the theories of public/merit goods and externalities. **[25]**

QUESTION 4

1. A community council is considering a 10-year community reforestation project. Initial capital costs in year 1 on land clearing, nursery costs for tree seedlings, land preparation, tree planting and road access are estimated at \$600 000. Annual plantation costs on protection of trees from fire and insects, maintenance (weeding) overheads and estate management are \$240 000 and occur in year 1 through to year 10. In year 10 of the project, the costs of cutting the trees (felling costs) are \$1 200 000. The sale of timber in the 10th year brings in \$10 625 000 in gross benefits or revenue to the community.

TASK: Given a Social Discount Rate of 18%,

- i) Compute the Benefit-Cost Ratio of the community reforestation project [Round discount factors to the nearest two decimal points] (10)
- ii) Compute the Net Present Value of the project (10)
- iii) On the basis of the results in i) and ii) above, say whether or not the community reforestation project would be socially beneficial. State the decision rules that guide your recommendation (5). **[25]**

QUESTION 5

- i) What is congestion pricing? (5)
- ii) What is the rationale/justification for congestion pricing? (5)
- iii) Which categories of infrastructure facilities are more suitable for congestion pricing and why? (5)
- iv) What would you consider as potential constraints to using traffic congestion pricing in a city such as Maseru. (10) **[25]**

QUESTION 6

Provide comprehensive notes on each of the following concepts in relation to the provision of public infrastructure facilities:

- i) LULUs and NIMBYs (5)
- ii) Fair Market value of land and improvements (5)
- iii) Impact/mitigation fees (5)
- iv) Planning obligations (5)
- v) Divestiture (5)