ECO111: Quiz 1

5 September 2024

INSTRUCTIONS

*This is a 50-minute quiz and you have to answer all 4 questions. Each question carries 15 marks.*

***Failure to mention your name and roll number, shall have your answer scripts cancelled.*** *Anyone seen using mobile phones or any other unacceptable practices will have their answer scripts cancelled by the TA or the instructor.*

*You shall not ask any questions (clarificatory or other) to the instructor or the TAs. In case you find ambiguities in the questions, answer it to the best of your understanding and mention the reasoning for your answer and mention a remark why you think the question was not clear.*

*In case you finish the test earlier than 50 minutes, you are still* ***required to stay*** *in class so as not to disturb your other classmates or other lectures.*

***For every question give succinct reasoning, only providing the final answer shall only fetch partial grades.***

*Good luck!*

QUESTIONS

1. Find all the Nash Equilibria (pure and mixed strategy) for the following three player game:

(You can work out the PSNE within the payoff matrices with suitable notations)

A close-up of a white background

Description automatically generated

1. Find the number of years it would take for an economy growing at a constant rate of 8% annually to double its GDP. (Given )
2. Consider the social interaction where Esther and Brian are deciding to watch either a series on Netflix or a football game on TV. The following payoff matrix represents their preferences

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Brian | |
|  |  | Football | Netflix |
| Esther | Football | 5, 8 | 1, 2 |
| Netflix | 2, 6 | 4, 4 |

1. Find the dominated strategy of Esther, dominated strategy of Brian.
2. What are the pure strategy Nash Equilibria of the game?
3. What are the mixed strategy Nash Equilibria of the game?
4. Comment about the game in relation to the game of BoS
5. Is the PSNE, a pareto efficient outcome?
6. Suppose a decision maker *i* has the following preferences over the set X of four goods X = {a, b, c, d}, represented by the payoff functions for which u(a) = 2, u(b) = -1, u(c) = 100, u(d) = 0.
   1. Are there any other payoffs to each of a, b, c, and d that could represent the same preferences as the one represented above. If yes, give an example and explain why the new payoffs represent the preferences of *i.*
   2. Suppose *u’* represents the new payoff functions which are defined as u’(a) = u(c) – u(b), u’(b) = u(d), u’(c) = u(c) – u(a), u’(d) = -2u(b). Do these payoffs represent *i’*s preferences? Explain why or why not.
   3. For what values of would u’( . ) = -u( . ) represent the decision maker *i*’s preferences?