CO

COMM ULUM

LEARNING

MIGHTY MINDS
Educational Consultants

CCE

COMMON CURRIC
ELEMENT

FOR
SENIOR

e

code: 27054531

MIGHTY MINDS
Educational Consultants

Create & Present

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MINDS

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ANA NG

43.

Analysing

Just a Game

Economics is more than just an array of graphs and statistics. *It is a complex syste*
correctly, allows businesses to predict and respond to movement in the market.

Game Theory

Game Theory is a way of modelling strategic decisions. First explored by
version of the theory assumes that all agents in the game will act inde
will do – and that they understand that their choices will affect the

In a game there is always:

- Agents (players)
- A set of possible strategies for each player.
- Rules
- Payoffs of each possible strategy for each playe

Consider the following matrix, known as the *Pri*
Game Theory. In the presented scenario, two
the following facts to each prisoner; howev

- If neither prisoner confesses they w
- If prisoner *A* confesses and priso
  visa versa).
- If they both confess, they wi

The matrix below shows the

Payoffs are shown num

	(-30,-1)
	(-10, -10)

Dominant strategy

A dominant strategy is the strategy that is the best choice for the player, no matter what the other player might choose.

Nash equilibrium

The Nash equilibrium occurs when both players play their dominant strategy and have no motive to deviate.

Just a Game

Q1 Analyse the information provided on the previous page. What is each

Q2 Why do you think that the Nash equilibrium … *Prisoners' Dilemma*?

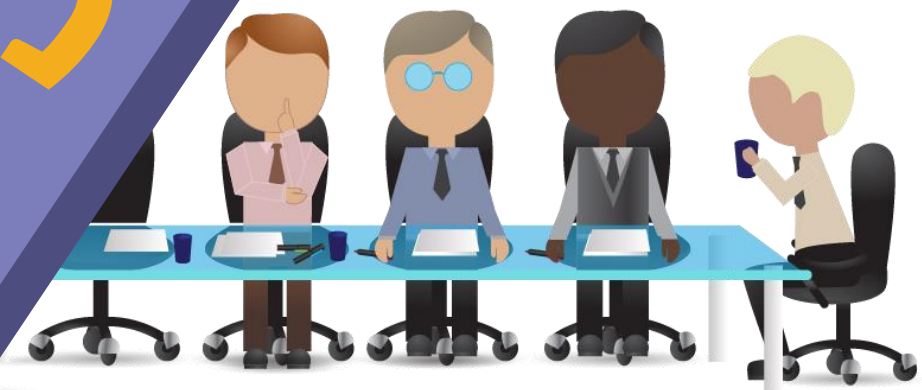
Q3 In the space provi… …er if writing an analytical essay on the given topic. You…

…odern business

Just a Game

Q4 Using the information you gathered in Question Three, write the intro
essay on the given topic (provided again below for convenience).

The relevance of Game Theory to the mo



Just a Game

Q5 Using the information provided in Question One, predict what each o
following payoff matrixes to determine the dominant strategy equi
contains the equilibrium.

Player *B* \ Player *A*	L	R
U	(4, 5)	(3, 7)
D	(0, 0)	(2, 1)

n occurs when
strategy that they

Player *A*'s dominant strate
The domin
is up.

a)

Player *B* \ Player *A*	L	R
U	(1	
D		

5, 131)	
(55, 254)	

Player *B* \ Player *A*	L	R
U	(2, 3)	(3, 1)
D	(4, 1)	(2, 2)

d)

Player *B* \ Player *A*	L	R
U	(2, 0)	(50, 25)
D	(1, 1)	(25, 2)

CCE

COMMON CURRICULUM ELEMENTS

FOR

SENIOR

TEACHER RESO

ue: 27054531

FOR THE TEACHERS

Item Description

Please note: any activity that is not completed during class time ma
undertaken at a later date.

'Just a Game'

- **Activity Description**:
  - This lesson has been designed to improve
    information that may be unfamiliar.
    - The activity, 'Just a Game', intr
      them to analyse the informati

    - ***Purpose of Lesson:***
      - To enhance stu
        information a

    - ***KLAs:***
      - Econom

    - ***CCEs:***
      - A

- **Suggested Time A**
  - This lesson

- **Teaching Not**
  - The a
    -

- **F**

stions:
be made in order for Game Theory to be accurate.
Game Theory?
you think Game Theory might be useful?

asking
ent ways.

unfamiliar
of situations.

nutes to complete.

mprove their analytical skills.
ccess to the internet for research.
work in small groups to consolidate their
Five.
d be encouraged to continue on with their essay,

Just a Game

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will do – and that they understand that their choices will affect the

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- A set of possible strategies for each player.
- Rules
- Payoffs of each possible strategy for each playe

Consider the following matrix, known as the *Pri*
Game Theory. In the presented scenario, two
the following facts to each prisoner; howev

nous example of a type of
rooms. the police have offered
ning to their answer:

- If neither prisoner confesses they w
- If prisoner *A* confesses and priso
- If they both confess, they wi

prisoner *B* will receive 30 years (and visa versa).

The matrix below shows the
nd confession (C).

Payoffs are shown num
t: (Payoff *A,* Payoff *B*).

		(-30,-1)
		(-10, -10)

Dominant strategy

A dominant strategy is the strategy that is the best choice for the player, no matter what the other player might choose.

Nash Equilibrium

The Nash equilibrium occurs when both players play their dominant strategy and have no motive to deviate.

Just a Game

Q1 Analyse the information provided on the previous page. What is each

Both prisoners *A* and *B* are going to play their dominant strategy. As they a

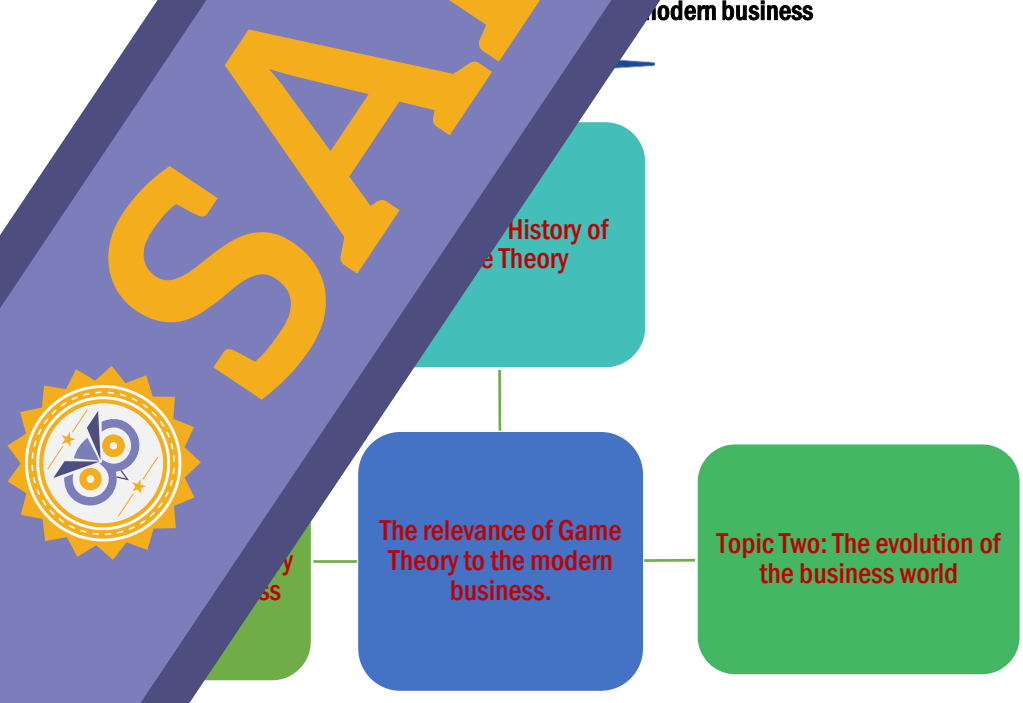
of action for them is to confess. This is because confession will either

sentence; however, remaining silent has the possibility of resultin

Q2 Why do you think that the Nash equilibrium *Prisoners' Dilemma*?

The Nash equilibrium, in the case of the prisoner problem with this, however, is that a joint confession will result eas if they both remained silent they would only receive five years i

Q3 In the space provi er if writing an analytical essay on the given topic. You

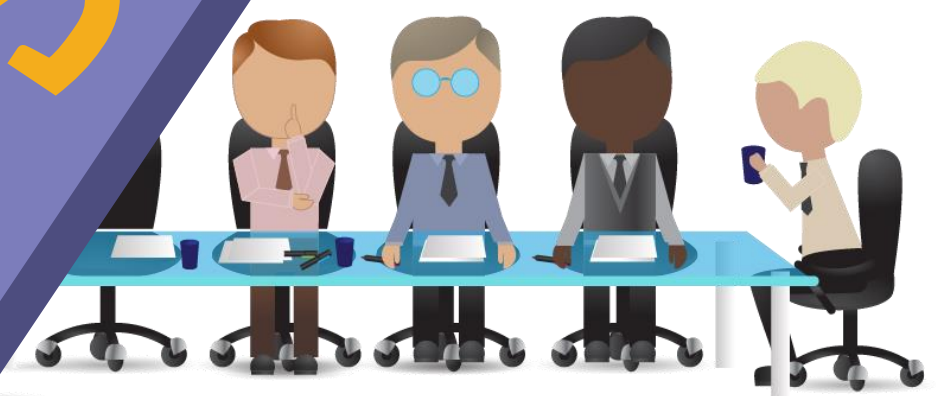


Just a Game

Q4 Using the information you gathered in Question Three, write the intro
essay on the given topic (provided again below for convenience).

The relevance of Game Theory to the mo

Despite the fact that Game Theory has been in use for thousand the
modern business. Dating back to even before 500AD, this t ess world
today. With technology becoming a fundamental and c transitioned
from being a simple idea to an umbrella term that Game Theory allows
businesses to predict, and respond to, their in



Just a Game

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Player *B* \ Player *A*	L	R
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a)

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U	(1	
D		

5, 131)	
(55, 254)	

Player *B* \ Player *A*	L	R
U	(2, 3)	(3, 1)
D	**(4, 1)**	(2, 2)

d)

Player *B* \ Player *A*	L	R
U	(2, 0)	**(50, 25)**
D	(1, 1)	(25, 2)

TEACHER'S ANSWER SHEET

Just a Game

Question One:

Before the commencement of Question One, students should have
Game Theory. Students were required to identify what each priso
case of the *Prisoner's Dilemma.* Students should have referred
to this question. The model response is provided below.

Model Response:

> *Both prisoners A and B are going to play their*
> *communicate, the best course of action for*
> *either result in a one-year sentence or a*
> *possibility of resulting in a thirty-year s*
> *ession will*
> *ilent has the*

Question Two:

Students were required to identify w
s Dilemma is considered
to be inefficient. Students may hav
wer this question. A model
response is provided below.

Model Response:

> *The Nash equilib*
> *The problem*
> *both prison*
> *imprison*
> *na, would be that they both confess.*
> *on will result in a ten-year sentence for*
> *they would only receive five years*

Qu

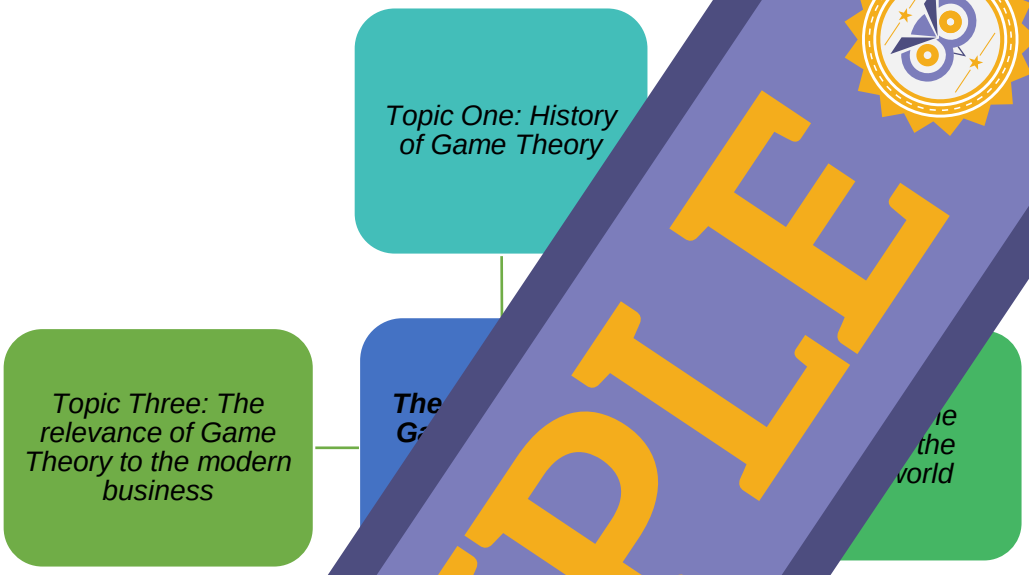
Studen
to the
thei
they would make in an analytical essay responding
the modern business. Students could have presented
mple response is provided on the following page.

This teacher's answer guide is continued on the next page...

...This teacher's answer guide is continued from the previous page.

Question Three (cont'd):

Example Response:



Question Four:

Students were required t analytical essay on the topic: *The relevance of Game Th* hould have mentioned the points they identified in Question elow.

Model Response

Desp n use for thousands of years, its relevance can sti Dating back to even before 500AD, this theory of ss world today. With technology becoming a y business, Game Theory has transitioned from being a at encompasses many facets of decision science. Game edict, and respond to, their internal and external environment.

This teacher's answer guide is continued on the next page...

TEACHER'S ANSWER SHEET

...This teacher's answer guide is continued from the previous page.

Question Five:

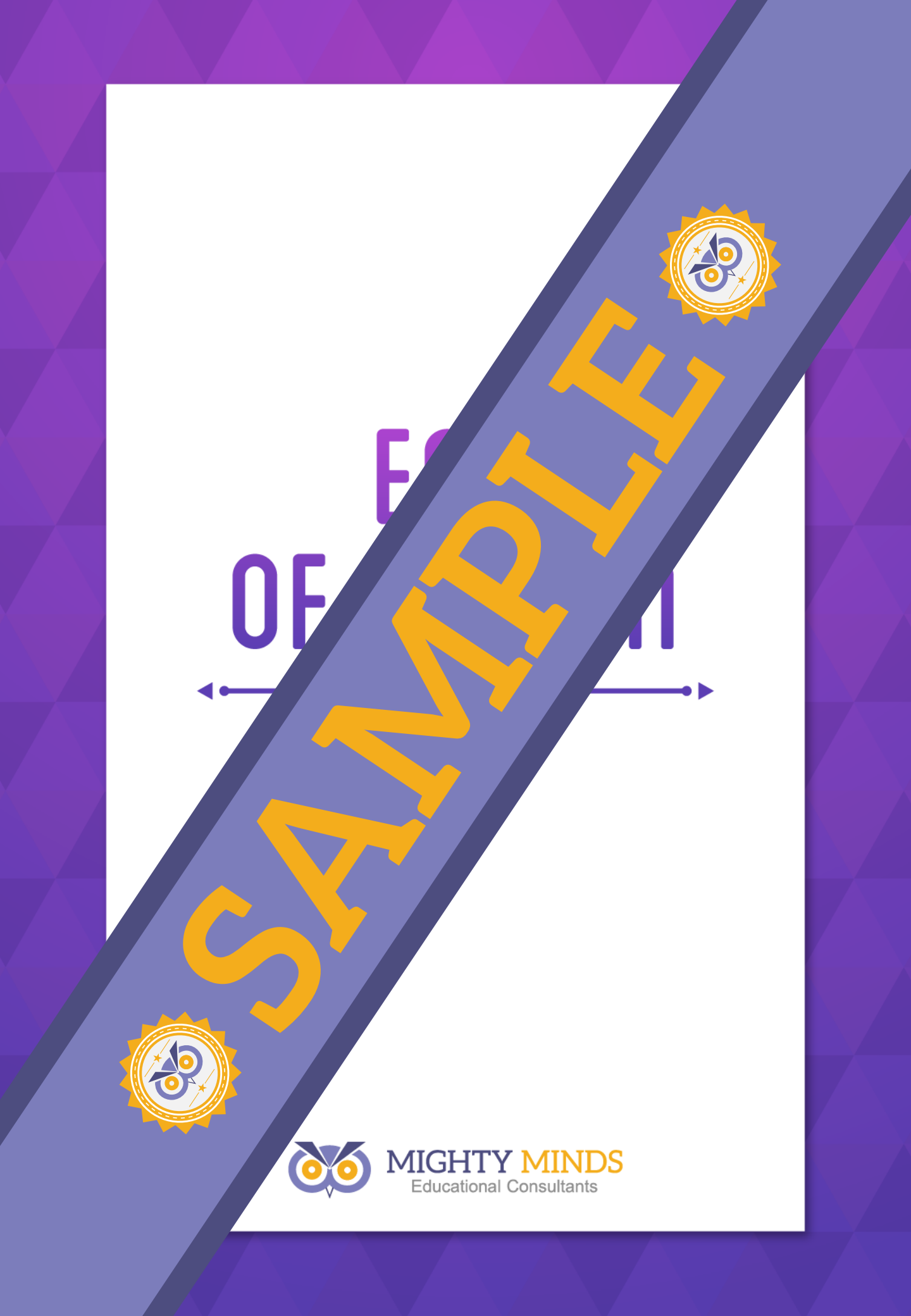
Students were required to identify the dominant strategy equilibrium
matrixes. An example was provided to help students. Students sh
were wanting to maximise their outcome. Then, they should hav
remembering that the outcomes were listed (A, B). The correct

Correct Response:

a)

Player B \ Player A	L	R
U	(10, 3)	(5, 1)
D	(5, 2)	(3, 1)

Player B \ Player A	L	R
U	(2, 0)	(50, 25)
D	(1, 1)	(25, 2)


SAMPLE
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