Exercises from lecture 10 (Cooperative game theory) TEK5010 Multiagent systems 2021

Question 1

A cooperative game is described by the following marginal contribution net:

$$a \wedge b \rightarrow 7$$
$$b \rightarrow 4$$
$$c \rightarrow 6$$
$$b \wedge c \rightarrow 3$$

Let v be the characteristic function defined by these rules.

a) Calculate the values of the following coalitions:

$v(\emptyset)$
$v(\{a\}), v(\{b\}), v(\{c\})$
$v(\{a, b\}), v(\{a, c\}), v(\{b, c\})$
$v(\{a, b, c\})$

b) Draw the weighted graph representing this game.

c) Is this game stable?

d) Calculate the Shapley value for each player in this game.