**Multiagent Systems Assignment 5**

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**Question**

Prove the DSIC of Groves mechanism.

**Explanation**

Groves mechanism mechanism here means VCG

**DISC**: Dominant Strategy Incentive Compatible

IC means:

To be truthful in reporting its type/evaluation is every agent’s own best interest.

To tell a lie or mis-information will be against the agent’s interest.

when IC is achieved in a dominant strategy equilibrium (so that truthfulness is best whatever the claims of other agents), it is DSIC.

**VCG**: The payment of bidder s in the th position =

(Values the other bidders receives without s) -(Values the other bidders receives with s)

Suppose apply VCG mechanism among a set of agents

Individual Rationality:

The VCG mechanism set truthful revelation as preferences. Each agent I reports their true valuation for the public good, which means it is dominant strategy for every agent . No matter what others choose, the agent get max payoff by truthfully giving the evaluation.

Incentive Compatible:

For agents in the VCG, no matter which term they are, the finally receive a lower term with lower price, or the equal place they want to get, each agent benefits from participating, regardless of the outcome. The VCG mechanism guarantees that each participant receives a payment or transfer such that they are at least as well off participating as they would be without participating. So, it is IC.

To sum up, IC is achieved in a dominant strategy equilibrium in the VCG mechanism, so it satisfies the DSIC.