Bulgarian IPhO Team Selection Tests

Following the Bulgarian Physics Olympiad, the ten highest-scoring participants are invited to a two-week training camp where the IPhO team is finalised. The files on this page contain the team selection tests given out at the camp between 2005 and 2025. Even though the organisers will allow the contestants to keep the problems, they seem reluctant to share them with next year's participants. Apart from that, no official solutions are published, which makes it quite difficult to actually prepare for the thing.

In 2024 I collated all the problems that I could get my hands on, and wrote detailed solutions for a good chunk of those. As of now, there are about 130 theoretical problems, 25 experimental problems, and 70 solutions. But since LLMs can now outdo humans when correctly prompted, I do not plan on writing any more solutions – sorry. Many problems are still missing, and if you can add something to the collection (email me!), it'd be greatly appreciated.

The exam format for the TSTs is as follows:

- Three separate short exams that consist of a single problem, to be solved in about an hour. Each short exam is worth 5 points, for a total of 15.
- A theoretical exam consisting of ten problems, which lasts for 5 hours. Each problem is worth 3 points, for a total of 30.
- An experimental exam consisting of two problems, also 5 hours long. The problems are worth 15 points, for a total of 30.

For better or worse, the rules are as constant as the north star, and they haven't changed since 2006. As for problem difficulty, the TSTs are generally easier than what you'd see in Kevin Zhou's handouts or Jaan Kalda's study guides (though there's the occasional backbreaker here as well). If you're looking for something to bridge the gap, these problems might be for you.

Now for the credits. The TSTs are managed by Miroslav Abrashev, Victor Ivanov, and Dimitar Marvakov. The problems are mostly their own, but many are taken from the massive MIPT problem book (4200 problems, better than Irodov and also more difficult; no solutions though). I would also like to acknowledge Georgi Aleksandrov, Margulan Ismoldayev, Georgi Kostadinov, and Bayan Gechev for digging up some of the problems and sharing them with me.

Finally, on the off chance that you want to make something similar, I've uploaded my `.tex` sources and figures to GitHub. I keep all the problems on separate files, which I then bind using a master file. The code should be legible, but if you need help, or, conversely, if you can improve the setup, do get in touch.

Good luck!
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Stefan Ivanov