

## TEAM COMPETITION PROBLEM

The Borobudur Temple, built in the 9<sup>th</sup> century, is the biggest Buddhist temple in the world built of stone. It is considered to be one of the wonders of the ancient world. It has nine stacked platforms. The first six platforms have a square form and beautifully decorated with numerous reliefs. The upper three platforms are circular, with 72 small bell-shaped stupas, surrounding one large central stupa (main stupa). The altitude of the ground close to the entrance is 265 m above mean sea level. Note that the height of the temple is 35 m (measured from the top of the main stupa to the ground).



We believe that the constructors of this temple had quite a good knowledge of astronomy. In search of the possible existence of the astronomical alignment between Borobudur and any celestial bodies, we will make some measurements. Observers are distributed around the temple, mainly on the eastern and western sides. The observing station number card (placed on the table) specifies the exact latitude and longitude for that station. Example coordinates for some stations are given in the table below.

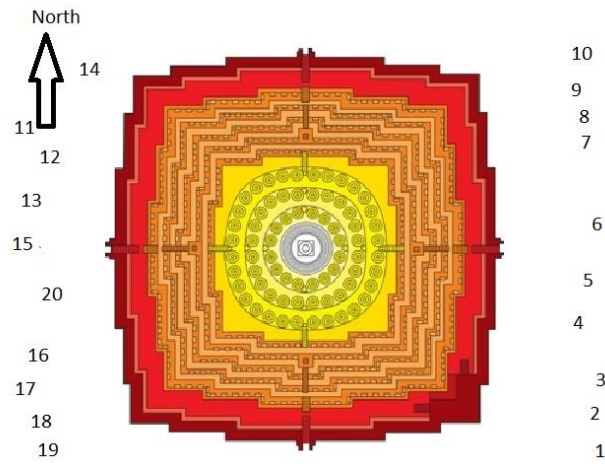


Table 1: Example Coordinates of observer's positions

Position	longitude	latitude	Altitude (m)
1	110° 12' 16.52"	-7° 36' 30.10"	264
2	110° 12' 16.69"	-7° 36' 29.80"	264
3	110° 12' 16.82"	-7° 36' 29.62"	264
4	110° 12' 16.65"	-7° 36' 28.85"	265
5	110° 12' 16.54"	-7° 36' 28.26"	264

From your position, if you observe the sky in the direction of the top of the main stupa (not of the top of the lightning rod), determine:

- If you observed at 18:00 (UTC+7), what constellation would align with the main stupa?
- Draw the constellations you expect to see from your position in the direction of the stupa at 18:00 and 19:00 (UTC+7).

Note: assume compass points to the true north

You are provided with:

- Planisphere
- Magnetic compass
- Protractor, string, and a weight

Describe your answer thoroughly.