IOAA 2019 – Keszthely, Hungary

Student ID code: ☐☐☐–☐☐

PLANETARIUM ROUND – ANSWER SHEET

3 projected images with questions. Each part is 15 minutes long. Total time: 45 minutes.

PROBLEM 1

This is the sky above Keszthely at midnight. The projected sky does not show any Solar System objects.

QUESTIONS / TASKS:

1.1. There are 3 novae on the projected sky at 2nd magnitude. Mark their positions by circles on the star chart. (Please circle only 3 stars. If there are more than 3 circles, then each one in a wrong location will result in 1 point deduction.) [ ]

1.2. The Messier objects have been removed from the star chart given you. Mark all the Messier list globular clusters present in the projected sky on the star chart using crosses (X) and write the Messier number of each object near the cross marks. [ ]

1.3. The projected sky corresponds to the second half of which month (at midnight CEST) in Keszthely? Circle the correct month.

JAN / FEB / MAR / APR / MAY / JUN / JUL / AUG / SEP / OCT / NOV / DEC [ ]

1.4. What is the local sidereal time? (To an accuracy of 15 minutes.)

…… [ ]

1.5. List six zodiacal constellations, which are partly or entirely visible. (Use the official IAU abbreviations or IAU designation. Every constellation named which is not visible in the projected sky will result in 1 point deduction.)

……

……

……

……

……

……

[ ]

PROBLEM 2

We are standing somewhere on the Earth. The projected sky does not show any Solar System objects.

QUESTIONS / TASKS:

2.1. Determine the geographical latitude of this observing site: ……° [ ]
In which hemisphere is the site situated? N / S (Circle the right one.) [ ]

2.2. Determine the azimuth of the 3 brightest stars on the projected sky. Azimuth is measured from North towards the East. Write the name of these stars in English or using their Bayer designation and their azimuths in the list below.

Bright star / name: …… Az: ……° [ ]

Bright star / name: …… Az: ……° [ ]

Bright star / name: …… Az: ……° [ ]

2.3. Yellow × signs show the position of 3 comets. Which comet is closest to the ecliptic? (Circle the number below.)

1 / 2 / 3 [ ]

2.4. List nine constellations that contain circumpolar stars seen from the given observing site. (Use the official IAU abbreviations or IAU designation.)

……

……

……

……

……

……

……

[ ]

2.5. Mintaka (δ Orionis) is setting at this moment. How many hours earlier did it rise? (To an accuracy of 15 minutes.)

…… [ ]

PROBLEM 3

For this view, we are now standing on the Moon. At this instant viewed, the Earth is centrally eclipsing the Sun (see the red circle on the sky). Consequently the Moon is at one of its nodes now. Assume the longitudinal and latitudinal librations are exactly 0° at this moment.

QUESTIONS / TASKS:

3.1. At the time of this observation, which season is it in Hungary? (Circle the correct answer.)

Spring / Summer / Autumn / Winter [ ]

3.2. There is a yellow circle on the projected sky (next to the red circle), which denotes minor planet Juno, which is at a distance of exactly 3 au from the Sun at this moment. Estimate its distance to the Moon at this instant. (Rounded to the nearest integer in units of million km.) Assume all orbits to be circular.

…….million km [ ]

3.3. Approximately how much time (in Earth days) after the projected event will …

…the Sun set at your observing site? …… [ ]

…the Earth set at your observing site? …… [ ]

3.4. Determine the Lunar (Selenographic) coordinates of this observing site (as defined in the lunar map on the next page):

……. [ ]

What is the name of the large surface lunar area, where your observing site is situated? Do not use your national language, please use the official IAU nomenclature.
(See lunar map on next page.)

…… [ ]

3.5. Estimate the distance from the observing site to the Apollo-11 landing site (0.6875 N, 23.4333 E):

…… km [ ]