OBSERVATIONAL TEST
PLANETARIUM

PART I
READ CAREFULY

Inside the dome:

1) The observational round in the planetarium consists of two parts, one inside the dome and the other outside the dome.
2) The part inside the dome consists of 3 questions and takes 30 minutes.
3) When you enter the dome, you will be directed to your seat, where you will find a clipboard with your answer sheet, one data table and a flashlight. During the adaptation time the students may stand and change the position around their place, but they are not allowed to communicate with each other. During the observation you can stand and turn in order to make a comfortable observation.
4) Fill your student ID in the box on the answer sheet.
5) PAY ATTENTION TO THE ASSISTANTS, and follow their instructions.
6) The timing for the first part is as follows:
   a) **8 minutes for your eye adaptation to the darkness;**
   b) **10 minutes for the first question;**
   c) **6 minutes for the second question;**
   d) **6 minutes for the third question;**
7) Use the flash light only when you need it and point it only at your paper.
8) When you leave the dome, leave everything on your seat.
9) PLEASE WRITE ONLY ON THE PRINTED SIDE OF THE ANSWER SHEET. DON'T USE THE REVERSE SIDE. The evaluator will not take into account what is written on the reverse of the answer sheet.

GOOD LUCK!

OBSERVATIONAL PLANETARIUM

PART I
Answer sheet

STUDENT ID	

Please write ONLY on this side of the paper

Question 1

The sky projected in the dome corresponds to Suceava (Long 26^0 15'), at 18:00 UT, on a certain day of a certain month.

You have 8 minutes to relax and familiarize your eyes with the darkness. During this time don't use the flash light.

Two arcs will then be projected. The arcs are segmented. Each segment represents an interval of some number of degrees. Note that this number is not the same for each arc.

10 minutes – Question 1

a. Identify each arc by circling the correct name and give the angular size of each segment (in degrees).

First arc	**Equator**	**Meridian**	**Ecliptic**	**Segment size**
Second arc	**Equator**	**Meridian**	**Ecliptic**	**Segment size**

b. Estimate the local sidereal time of the sky you see in the dome.

$\theta_{sidereal}$	

c. Determine the month to which the projected sky would correspond at the given time. Fill in the box the number of the month (1 to 12).

Month number	

OBSERVATIONAL PLANETARIUM

PART I
Answer sheet

STUDENT ID	

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Question 2 and 3

For questions 2 and 3 the assistant will use a small red arrow pointer to point some objects in the sky. Each object will be pointed at for **2 minutes** (30 seconds arrow pointer on and 10 seconds off)**.** Please pay attention to the assistant announcements.

6 minutes – Question 2

The locations of three Messier objects will be pointed at one by one. For each Messier object pointed to, fill in the boxes with its Messier catalog number and the number which indicates its type, based on the following: **1 for galaxy, 2 for nebula, 3 for open cluster, 4 for globular cluster.**

Also, for each object, fill in the IAU abbreviation of the constellation where the star is located. Refer to **Table 1** for the abbreviations.

1st Messier object		Number which indicates the type		IAU abbreviation of the constellation	
2nd Messier object		Number which indicates the type		IAU abbreviation of the constellation	
3rd Messier object		Number which indicates the type		IAU abbreviation of the constellation	

6 minutes – Question 3

Three stars will be pointed at successively. Each star will be pointed at for 2 minutes. Fill the appropriate box with the name of the star (or the Bayer designation) and the number which indicates its type (**1 for single, 2 double**).

For each star, also fill in the IAU abbreviation of the constellation where the star is located. Refer to **Table 1** for the abbreviations.

1st Star		Number which indicates the type		IAU abbreviation of the constellation	
2nd Star		Number which indicates the type		IAU abbreviation of the constellation	
3rd Star		Number which indicates the type		IAU abbreviation of the constellation	

You have finished the first part. Verify that have written your student ID on every page. Attach the answer sheers to the clipboard and leave it on your seat along with the flashlight, and then exit the dome.

OBSERVATIONAL

PLANETARIUM

PART II Star chart
Indication

Star chart:

You have 30 minutes to finish this part.

Please use only pencil to make the drawings and markings.

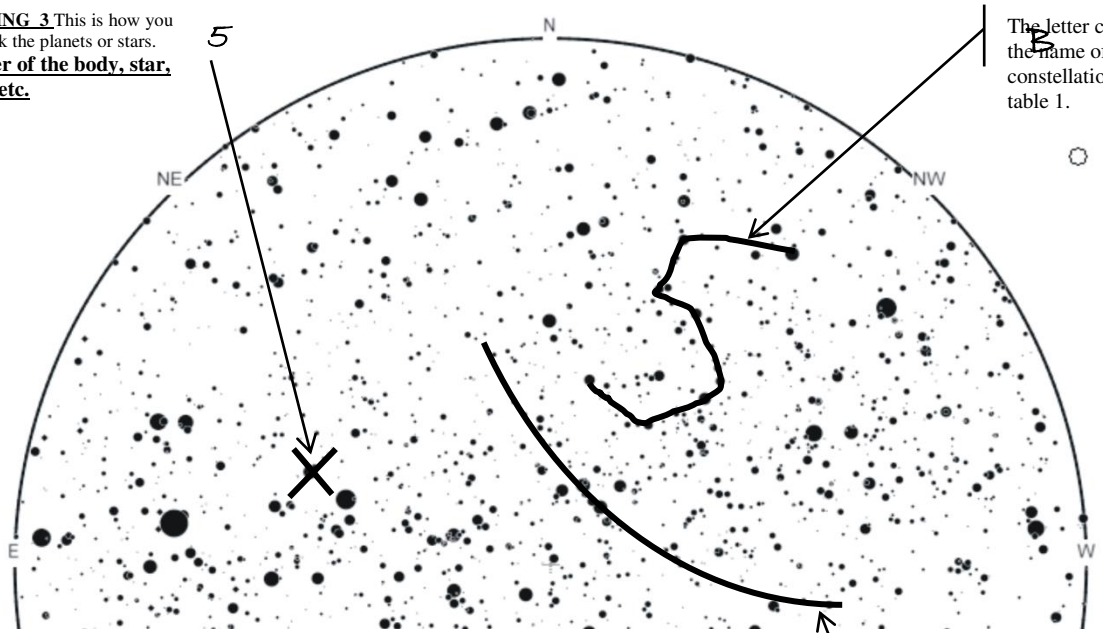
After you finish this part, write your student ID on the answer sheet as well as on the sky map.

Put the answer sheets in the folder; leave the compass, the ruler and the pencil on the table.

Thank you!

In this part you will use the sky-map found in the envelope. The map represents the sky in Suceava (Latitude 47^0 39' North, Longitude 26^0 15' East) on the day of the test at 22:00 local time. The observer who made the sky-map was at a very high altitude above Suceava; the Zenith point is in the center of the chart. Please use a pencil for marking and drawing lines on the sky-map. Use the example markings 1, 2 and 3 shown below to draw lines and mark objects on the map.

HOW TO DRAW AND MARK OBJECTS ON THE SKY-MAP



MARKNG 2 This is how you will mark the constelations.

The letter corresponds to the name of the constellation according to table 1.

MARKING 3 This is how you will mark the planets or stars. **Number of the body, star, planet etc.**

MARKING 1 This is how you will draw the curves/lines and indicate what it represents.

OBSERVATIONAL PLANETARIUM

PART II – outside the dome
Answer sheet

STUDENT ID	

Please write ONLY on this side of the paper

Questions

The map represents the sky in Suceava (Latitude 47^0 $39'$ North, Longitude 26^0 15' East) at 19:00 UT on the day of test. The observer who made the sky-map was at a very high altitude above Suceava; the Zenith point is in the center of the chart. Solve question 1 to 4 on one copy of the map and questions 5 to 8 on the second copy of map.

1. Draw on the map the horizon for an observer located on the ground in Suceava. (2 points)
2. Draw the celestial equator, the ecliptic, the galactic equator and the local meridian on the map with continuous lines. (8 points)
3. Mark the cardinal points (as N for north, E for east, S for south and W for west). Mark all the planets (except Uranus and Neptune) of the Solar System on the map and number them as 1, 2, …,6 in the order of increasing orbital radius (Skip number 3 for the Earth). Note that planets are <u>not</u> currently shown on the map. (9 points)
4. Identify and mark the four brightest stars in visual band above the horizon line. Number the star starting from **1** – the brightest, and continue with the fainter ones till number **4** for the faintest. Fill in the following table the Bayer name of the four identified stars. (4 points)

Marking on the map	1	Name of the star	
	2	Name of the star	
	3	Name of the star	
	4	Name of the star	

5. Draw approximate figures of any 15 constellations which lie <u>completely above</u> the horizon on the map. Each constellation you mark should be identified on the map with the IAU abbreviation, using **Table 1**. (6 points)
6. Mark on the map the positions of the following objects: (5 points)
   a. The Messier objects: M31, M27, M13;
   b. β Cygni, δ Ursa Minoris.
7. Estimate the sidereal time of the map; write the value in the box to the right. (10 points)

8. Estimate the equatorial coordinates (right ascension and declination) of the star Altair (α Aquilae). Write your answer in the box. (6 points)

α=

δ=

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PART II – outside the dome
Answer sheet

STUDENT ID	

Please write ONLY on this side of the paper