Theoretical round. Basic criteria. For work of Jury

Note. Jury members should evaluate the student's solutions in essence, and not by looking on formal existence the mentioned sentences or formulae. The formal presence of the mentioned positions in the text is not necessary to give the respective points. Points should be done if the following steps de facto use these positions. (For example, except the final conclusion and artistic picture, all the points in solution of problem 2 may be in only one common formula.)
Of course, fractions of the mentioned points should be awarded if only part of the item was done.
Note. Jury members may elaborate more detailed criteria, and also create criteria for other correct ways of the student's solutions.
Note. Everywhere "formula" means "correct formula", "calculation" means "**correct** calculation", "picture" means "**correct** picture", etc., and in all cases: based on **correct** facts and intermediate formulae or calculations.
Note. Everywhere final calculation means also using correct number of significant digits. Excessive number of significant digits, especially in estimational problems, will lead to subtraction of the points (column "digits", minus 1-2 points).
Note. Solutions with **absurd** or **almost absurd** answers should be rated lower (maybe ignoring the scoring schemes below, and maybe down to zero, column "absurd").

Any suggestions for modifying the criteria are welcome, write justifications to gavrilovissp@list.ru and gavrilov@issp.ac.ru (to both addresses for reliability), if the suggestions are reasonable, the proposal can be approved.

1.	**Ancient observations**	pts
	General understanding	1
1.1.	Latitude formula	1
	Latitude calculations	1
1.2.	Angle of inclination of the ecliptic formula	1
	Angle of inclination of the ecliptic calculations	1
1.3.	Formulas	2
	Calculations	1
	Total	8

2.	**NGC of the Year**	pts
	Formula connecting altitude with angle below horizon	1.5
	Formula for the upper culmination of the lowest point of NGC 2025 in Dhaka	1
	Refraction, understanding first $35'$	1
	Refraction, understanding second $35'$ or little less than $35'$	1
	Calculations the upper culmination of the lowest point of NGC 2025 in Dhaka	1
	Calculations of the altitude	1
	Final answer (depending of reality)	1.5
	Total	8

3.	**Comet Lemmon**	pts
3.1.	Actual semimajor axis of the orbit	1
	Actual orbital period	1
	Actual eccentricity of the orbit	1
3.2.	Steps to get new eccentricity of the orbit	2.5
	Actual eccentricity of the orbit	1
	Actual orbital period	1
	Final conclusion	0.5
	Total	8

4.	**On a remote exoplanet**	pts
	Thermal balance	0.8
	Formula for incoming power	0.5
	Formula for outgoing power	0.4
	Using albedo	0.4
	Using greenhouse effect	0.4
	Analyzing time from sunrise to sunset vs half a day, additional angular sizes	0.8
	Using dependence on the angular size of the central star	0.8
	Using any refraction	0.4
	Using refraction depending on atmospheric pressure	1.1
	Using spectral class of the Sun or temperature of the Sun	0.4
	Final formula and/or correct calculations	0.8
	Final correct result in a range K5-K9	0.8
	Postulating “Not depending on [#1, 2, 3]”	0.4
	Total	8

5.	**Canopus and Sirius**	pts
5.1.	Understanding about upper culmination	0.5
	Using right ascension of Canopus	1
	Using difference in days since autumnal equinox	0.5
	Using Dhaka is located about 0.5° East from the 90° meridian	0.5
	Final formula and calculations	1
5.2.	Altitude of Canopus at upper culmination	0.6
	Altitude of Sirius at the time of upper culmination of Canopus	0.6
	Extinction in atmosphere	1
	Using limit of visibility by the naked eye	0.4
	Calculation the layers of atmosphere for Canopus and Sirius	0.8
	Final formula and/or correct calculations, final answer	1.1
	Total	8

6.	**Model of the Universe**	pts
6.1.	General understanding the situation	0.8
	Kepler's Third Law	1
	Distance to the Sun in this model	1.2
	Diameter of the Sun in this model	1
6.2.	General understanding about the sphere of fixed stars	0.7
	Relation between δ = 10″ and doubled daily parallax	1
	Final formula	0.8
	Calculations and final answer	0.5
	Important feature in the final answer: "**more than …**" or sign "**>**"	0.5
	Order of the distances to the Sun, Mercury, Venus and Mars	0.5
	Total	8

7.	**Distant galaxy**	pts
	Understanding that the first line in each series is the line for which n = m+1	1
	Calculation λ_B/λ_α and z	1.6
	Understanding receding velocity close to speed of light or calculating the receding velocity of the galaxy with exact formula	1.6
	Answer for the velocity	0.8
7.2.	Formula for the distance	1.8
	Calculation of the distance and final answer	1.2
	Total	8