Question 3 **Solar System objects (7 points)**

A set of data containing the apparent positions of 4 Solar System objects as observed at Chiang Mai, Thailand, over a period of 1 calendar year is given in Table 1. Analyze the data carefully and answer the questions as well as showing the method used to obtain the results.

Location of observer	Latitude :	N 18° 47' 00.0"
	Longitude :	E 98° 59' 00.0"

3.1 Identify the objects A, B, C, and D by names. **(2 points)**

3.2 Which object can be observed with the longest duration at night time by unaided eye? **(0.5 points)**

3.3 What is the date that the object in 3.2 can be observed with the longest duration at night time? **(0.5 points)**

3.4 Indicate the positions of the four objects and the Earth on the date in 3.3, in the orbit diagram provided in your answer sheet. The answer (sheet) must show one of the objects as the Sun at the centre of the Solar System. Other objects including the Earth must be specified together with the correct values of elongation on that date. **(4 points)**

Marking Scheme

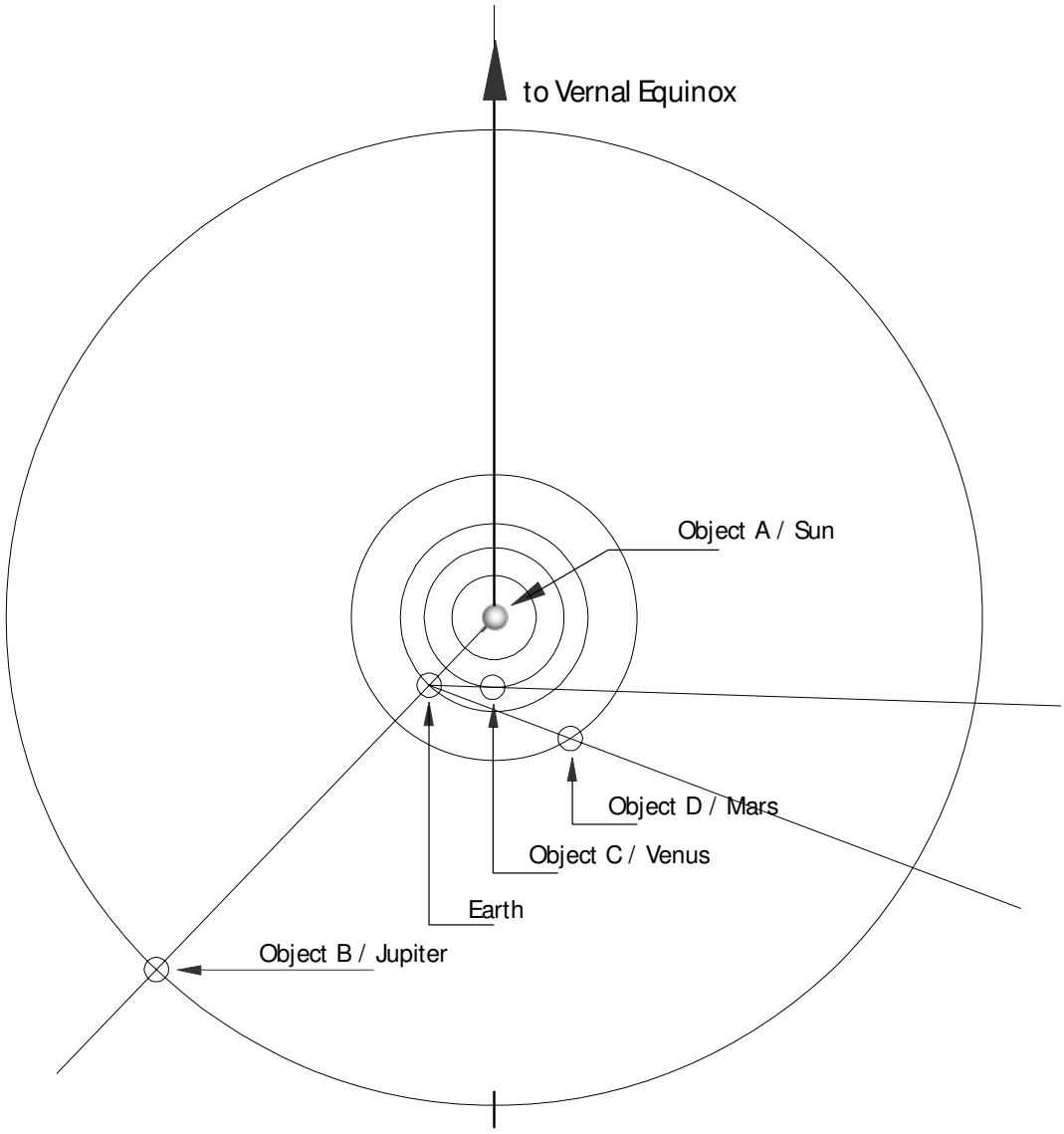
3.1

Object	Name	Point
Object A	**Sun**	**0.50**
Object B	**Jupiter**	**0.50**
Object C	**Venus**	**0.50**
Object D	**Mars**	**0.50**

3.2 Object B (0.5 points)

3.3 3rd February (0.5 points)

3.4



- **Correct position of the Earth relative to the Sun (46º before RA=0h) (1 point)**

- **Correct position of object in the orbit**

  Venus (C) = 0.5 points

  Mars (D) = 0.5 points

  Jupiter (B) = 0.5 points

- **Correct value of elongation angle**

  Venus (C) = 48.07 º (0.**5 points**)

  Mars (D) = 69.39 º (0.**5 points**)

  Jupiter (B) = 181.20 º (0.**5 points**)