

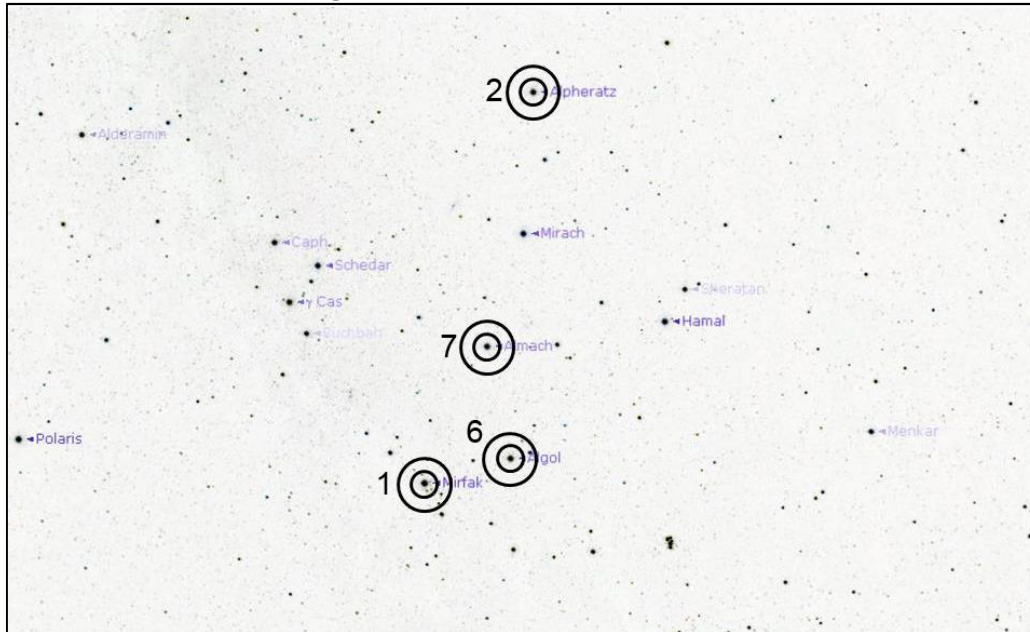


## Solutions and Marking Scheme

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Solution 1:

Figure 2 – Solution of Problem 1





### Marking Scheme:

#### Part 1: Location of each bright star:

- A) Small Circle + Correct Number: +10 points.
- B) Large Circle+ Correct Number: +5 Points.
- C) Small Circle without Identifier Number : +5 Points
- D) Large Circle without Identifier Number: 0 Point.
- E) Small or Large Circle+ Incorrect Identifier Number: 0 Point.

### Solution 2:

#### Part 1:

Table 2

Angular Distance	
Stars Name	Angular Distance (Degree)
1 (Errai ) and 2 (Alfirk )	$11^{\circ}:09':10'' \sim 11^{\circ}$
1 (Errai ) and 3 (Alderamin)	$18^{\circ}:36':50'' \sim 19^{\circ}$

### Marking Scheme:

Part 1:  $\Delta$  = Error in estimation of angular distance.

$\Delta \leq 2^{\circ}$  : 20 points

$2^{\circ} < \Delta \leq 4^{\circ}$  : 10 Points

$\Delta > 4^{\circ}$  : 0 Point



Part 2:

**Table 4**

<b>Magnitude Estimation</b>		
<b>Number</b>	<b>Star Name</b>	<b>Visible Magnitude</b>
2	Alfirk	3.2
3	Alderamin	2.4

**For Each Star:**

- $\Delta m \leq 0.2$  : 20 points
- $0.2 < \Delta m \leq 0.5$  : 15 Points
- $0.5 < \Delta m \leq 0.8$  : 10 Points
- $0.8 < \Delta m \leq 1.0$  : 5 Points
- $1.0 < \Delta m \leq 1.2$  : 2 Points
- $\Delta m > 1.2$  : 0 Point

**Solution 3:**

<b>Coordinate of Selected Star</b>				<b>Local Time :</b>
<b>Star</b>	<b>Hour Angle</b>	<b>R.A.</b>	<b>Dec.</b>	
Deneb (Alpha Cygni)	ST-RA	20h 41m	+45°	<b>Sidereal Time :</b>
Alfirk (Beta Cephei)	ST-RA	21h 28m	+71°	
Algol (Beta Persei)	RA-ST	03h 08m	+41°	
Capella (Alpha Aurigae)	RA-ST	05h 18m	+46°	



## Marking Scheme:

### Part 1: Point the Telescope to the coordinates of the selected stars.

If the examiner confirms the star in the 32 mm eyepiece: 40 Points

If the examiner confirms the star in the finder scope: 20 Points

If the examiner doesn't see the star in Finder : No Point

### Part2: Estimate Hour Angle and Declination. ( $\Delta$ = Error)

HA:  $\Delta \leq 30 \text{ min}$  : 20 points  
 $30 \text{ min} < \Delta \leq 45 \text{ min}$  : 15 Points  
 $45 \text{ min} < \Delta \leq \text{hour}$  : 10 Points  
 $1 \text{ hour} < \Delta \leq 1.5 \text{ hour}$  : 5 Points  
 $\Delta > 1.5 \text{ hour}$  : 0 Point  
If Participant estimates R.A. Instead of H.A.: 20 Point

Dec:  $\Delta \leq 2^\circ$  : 20 points  
 $2^\circ < \Delta \leq 4^\circ$  : 15 Points  
 $4^\circ < \Delta \leq 8^\circ$  : 10 Points  
 $8^\circ < \Delta \leq 10^\circ$  : 5 Points  
 $\Delta > 10^\circ$  : 0 Point