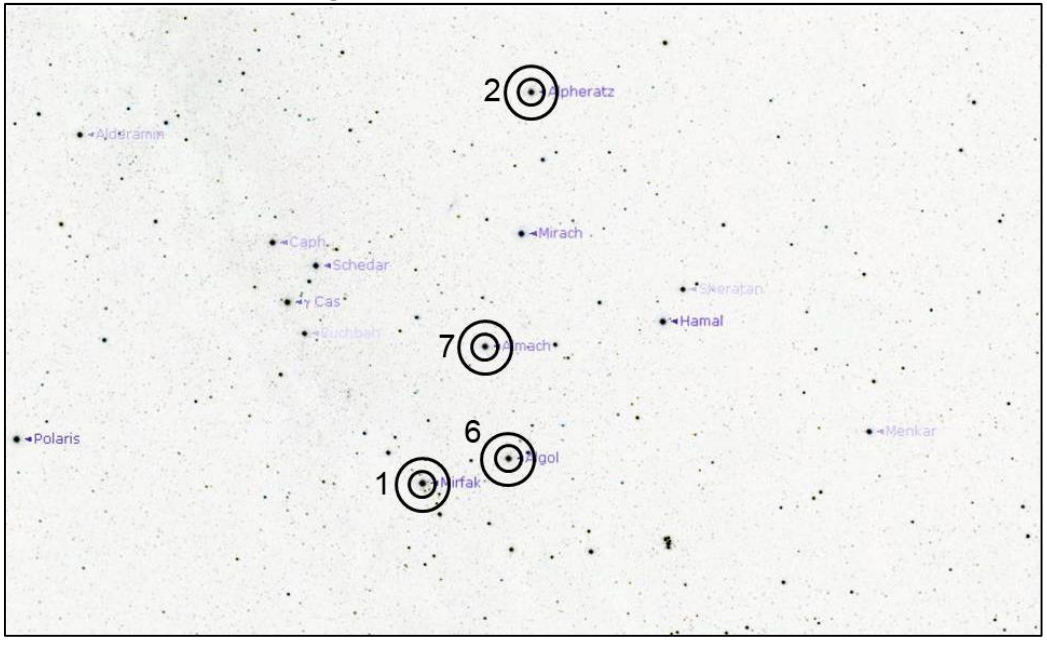
Solutions and Marking Scheme

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

Magnitude Estimation		
Number	**Star Name**	**Visible Magnitude**
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:

Coordinate of Selected Star				**Local Time :**
Star	**Hour Angle**	**R.A.**	**Dec.**	
Deneb (Alpha Cygni)	ST-RA	20h 41m	+45°	
Alfirk (Beta Cephei)	ST-RA	21h 28m	+71°	**Sidereal Time :**
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. (Δ= Error)

HA: $\Delta \leq 30\ min$: 20 points
$30\ min < \Delta \leq 45\ min$: 15 Points
$45\ min < \Delta \leq hour$: 10 Points
$1\ hour < \Delta \leq 1.5\ hour$: 5 Points
$\Delta > 1.5\ hour$: 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