

# Optics

Haslett Invitational – 1/25/25

Team No. \_\_\_\_\_ Team Name \_\_\_\_\_

Competitor Names \_\_\_\_\_

- Please write all answers on answer sheets provided, writing in test booklet will not be graded.
  - Please use capital letters for answers to multiple-choice questions.
- You will have 45 minutes to work on the test.
  - At some point during the test, your team will be called to one of the laser-shoot setups.
- Tiebreakers: Q46, Q1, Q2, Q3...

Q #	Answer	Grading Only
1	1.82x10 <sup>8</sup> (m/s)	/3
2	N	/1
3	Y	/1
4	N	/1
5	Y	/1
6	Q3 - Fused quartz → Water	/1
7	97.5 (°)	/4
8	A C E	/5
9	C	/2
10	Larger field-of-view (reduces blind spot)	/2
11	Safety applications (cross-traffic in parking garages, factories, etc.); anti-theft mirrors in stores; etc.	/1
12	B	/2
13	D	/2
14	If they were spherical, the light would not focus at a point ("spherical aberration")	/2

Q #	Answer	Grading Only
15	40.0 (cm)	/2
16	104 (cm)	/2
17	-1.6	/2
18	Real	/1
19	Inverted	/1
20	E	/1
21	6.7x10 <sup>-3</sup> (cm <sup>-1</sup> )	/4
22	150 (cm)	/2
23	-150 (cm)	/2
24	Virtual	/1
25	2	/2
26	-1.3x10 <sup>-3</sup> (cm <sup>-1</sup> )	/2
27	No	/1
28	B	/2

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Q #	Answer	Grading Only
29	F Allows light in / controls amount of light entering eye	/2
30	H Focuses light on retinal surface	/2
31	B Adjusts lens	/2
32	L Contains photoreceptive cells	/2
33	M Provides sharp central vision	/2
34	E	/1
35	A	/1
36	Would lose visual acuity, light & images would not focus on retina	/2
37	Cone	/1
38	C	/2
39	D	/2
40	Red	/2
41	Black	/2

Q #	Answer	Grading Only
42	50 (%)	/2
43	It would not change	/1
44	46.7 (%)	/2
45	It would not change	/1
46	Tiebreaker only – use graph paper	/0
47	A	/1
48	56.7 (°)	/1
49	False	/2