# OES <br> Grade 10 Science SNC2D <br> TEST Physics 

Duration: 75 minutes

## STUDENT NAME: <br> Last Name <br> First Name

| K/U | Th/Inv | App | Comm |
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| $/ 14$ | $/ 13$ | $/ 9$ | $/ 12$ |

## Part 1: Knowledge and Understanding. Circle the correct answer.

Multiple Choice(1 mark each)
Identify the letter of the choice that best completes the statement or answers the question.

1. The focus of a concave mirror is 35 cm from the vertex, and its centre is 60 cm from the vertex. Where would you place an object in order to have the mirror reflect a virtual image rather than a real image?

a. 30 cm from the vertex
b. 45 cm from the vertex
c. 60 cm from the vertex
d. 75 cm from the vertex
2. You are holding a flashlight so the beam strikes a plane mirror at an incident angle of 38 ?. What is the measure of angle $x$ between the reflected light ray and the mirror?

a. 38 ?
b. 52 ?
c. 90 ?
d. 155 ?
3. Where will the image of this object be located?

a. at $F$
b. between $F$ and $C$
c. between $F$ and $V$
d. at $C$
4. Which kind of mirror would you put at the end of your driveway in order to let you see as wide a view of the street as possible?
a. converging mirror
b. diverging mirror
c. plane mirror
d. combination of mirrors
5. A company wants to make glow-in-the-dark toys. They coated the toys with a fluorescent material. They are very bright in daylight, but do not glow in the dark. What should the company do?
a. Leave the toys in sunlight longer.
b. Keep the toys away from sunlight.
c. Coat the toys with phosphorescent material.
d. Coat the toys with material that gets incandescent when heated.
6.Which of the following is associated with heat?
a. triboluminescence
b. fluorescence
c. phosphorescence
d. incandescence
6. Which of the following is luminous?
a. a tree
b. the Moon
c. a book
d. a fire
7. An object is placed at C . What kind of image will this situation produce?

a. real, upright, same size as the original
b. real, inverted, smaller the original
c. real, inverted, same size as the original
d. virtual, upright, same size as the original
8. What is a normal line?
a. A line that is perpendicular to the angle of incidence,
b. A line that is perpendicular to the angle of reflection.
c. A line that is perpendicular to the reflecting surface.
d. A line that is parallel to the angle of incidence.
9. A convex mirror has a wider field of view than a plane mirror because the reflected image
a. is virtual
b. appears to be behind the mirror
c. is not inverted, as images in concave mirrors are
d. is reduced, which allows more of it to fit into the mirror
10. Water's index of refraction is 1.33 . The speed of light in water is
a. $2.26 \times 10^{8} \mathrm{~m} / \mathrm{s}$
b. $1.33 \times 10^{8} \mathrm{~m} / \mathrm{s}$
c. $4.43 \times 10^{8} \mathrm{~m} / \mathrm{s}$
d. $3.24 \times 10^{8} \mathrm{~m} / \mathrm{s}$
11. The speed of light in a diamond is $1.24 \times 10^{8} \mathrm{~m} / \mathrm{s}$. What is the index of refraction of a diamond?
a. $\quad 1.47$
b. 2.42
c. 1.49
d. 2.01
12. An optical company has come up with a new type of glass that it says has an index of refraction that is less than 1.0 . How likely is the claim to be true?
a. Very likely, because the speed of light in a medium with an index of refraction of less than 1.0 would be greater than $c$.
b. Unlikely, because all glass has an index of refraction that is greater than 2.0.
c. Unlikely, because the speed of light in a medium with an index of refraction of less than 1.0 would be less than $c$.
d. Highly unlikely, because the speed of light in a medium with an index of refraction of less than 1.0 would be greater than $c$.
13. Olive oil's index of refraction is 1.48 . The speed of light in olive oil is
a. $2.23 \times 10^{8} \mathrm{~m} / \mathrm{s}$
b. $4.93 \times 10^{8} \mathrm{~m} / \mathrm{s}$
c. $2.03 \times 10^{8} \mathrm{~m} / \mathrm{s}$
d. $2.03 \times 10^{7} \mathrm{~m} / \mathrm{s}$

## Part 2: Thinking and Investigation

For the following questions, write the most appropriate answer in the space provided.

1. What does SALT stand for? How does it help you describe the properties of an image? (3 marks)
2. How are the rules for locating an image in a convex mirror different from those for a concave mirror? (2 marks)
3. Draw the image as it would appear in a plane mirror and complete the SALT (size, attitude, location and type) image below (5 marks):


Size:
Attitude:
Location:
Type:
4. Draw the image that would result from this reflection in a diverging mirror. (3 marks)


## Part 3: Application

For the following questions, write the most appropriate answer in the space provided.

1. Provide and describe 1 application (uses) for convex mirrors. (2 marks)
2. Provide and Describe $\mathbf{2}$ applications that make use of total internal reflection of light (3 marks)
3. How would you explain to a friend why a soda straw in a container of water looks bent? Include a diagram in your explanation. (4 marks)

## Part 4: Communication

For the following questions, write the most appropriate answer in the space provided.

1. How is an image in a plane mirror different from an image in a concave mirror? ( 2 marks)
2. The image of an arrow-shaped object is shown. Is the arrow-shaped object that created this image pointing up or down? How do you know? (2 marks)

3. Complete the table for an object placed in a concave mirror. (8 marks)

| OBJECT | IMAGE |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Location | Size | Attitude | Location | Type |
| beyond C |  |  |  |  |
| at C |  |  |  |  |
| between C and F |  |  |  |  |
| inside $F$ |  |  |  |  |

