Here is the **complete answer key** for the test:

**Science Olympiad Division B Optics Test - Answer Key**

**Part 1: Multiple Choice (20 points)**

1. **b. Diffuse reflection**
2. **a. The ratio of the speed of light in a vacuum to the speed of light in the material**
3. **c. Between the mirror and the focal point**
4. **c. Dispersion**
5. **a. Red, Blue, Green**
6. **b. Lens**
7. **a. M=hiho=didoM = \frac{h\_i}{h\_o} = \frac{d\_i}{d\_o}**
8. **c. Black**
9. **a. Positive**
10. **b. Virtual, upright, and the same size as the object**

**Part 2: Short Answer (15 points)**

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**A screenshot of a math problem

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**Part 4: Color Theory and Pigments (15 points)**

1. **Mixing Primary Paint Colors**:
   * a. Cyan + Magenta = Blue
   * b. Cyan + Yellow = Green
   * c. Magenta + Yellow = Red
   * d. Cyan + Magenta + Yellow = Black
2. **White Appearance**:
   * No pigments are imparted; the object reflects all colors of light.
3. **Black Appearance**:
   * All primary pigments (Cyan, Magenta, Yellow) are imparted to absorb all light.
4. **Absorption by Pigments**:
   * Cyan absorbs **Red**.
   * Magenta absorbs **Green**.
   * Yellow absorbs **Blue**.
5. **Color Equations and Pigments**:
   * a. R+G+B−B=R+G=Yellow;R + G + B - B = R + G = Yellow; Yellow pigment is present.
   * b. R+G+B−G−B=R=Red;R + G + B - G - B = R = Red; Magenta and Yellow pigments are present.
   * c. R+G+B−R=G+B=Cyan;R + G + B - R = G + B = Cyan; Cyan pigment is present.
   * d. R+G+B−G=R+B=Magenta;R + G + B - G = R + B = Magenta; Magenta pigment is present.
   * e. R+G+B−R−G−B=Black;R + G + B - R - G - B = Black; Cyan, Magenta, and Yellow pigments are present.