1. Indicate in the blanks below which vergence disorder case type is represented by each of the zones of clear single binocular vision below.

A. **Recessed**
   
B. **Divergence Excess**
   
C. **Convergence Excess**
   
D. **Divergence Insufficiency**
   
E. **Convergence Insufficiency**
   
F. **Relaxed Ductions**
   
G. **Near Exophoria**
   
H. **Near Esophoria**

---

A. 
**Baseline**

B. 
**Exo Vertical**

C. 
**Exo Vertical**

D. 
**Normal**

E. 
**Exo Vertical**

F. 
**Reduction Insufficiency**

G. 
**Normal**

H. 
**Exo Vertical**
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2. When performing low neutral dynamic retinoscopy with the target at 40 cm, you obtain neutral with a +0.75 D add. At this neutral point, what are the (a) accommodative stimulus and (b) the accommodative response?

a) \( +2.50 \text{ D} - 0.75 = (1.75 \text{ D}) \) at neutral \( AR = +45 \)

b) \( +1.75 \text{ D} \)

3. A 50 year old patient has an NRA of +0.75 D and a PRA of -1.25 D when the NRA and PRA are started with a lens power of +1.50 D. Using the rule that says to balance the NRA and PRA, what add would you recommend?

\[
\begin{align*}
\text{NRA} & = +1.50 \\
\text{PRA} & = -1.25 \\
\text{Add} & = 2.25
\end{align*}
\]

\[
\begin{align*}
\text{NRA} & = -0.25 \\
\text{PRA} & = -1.00 \\
\text{Add} & = 1.25
\end{align*}
\]

4. According to Holstetters's formulas, what are the (a) maximum expected, (b) probable, and (c) minimum expected amplitudes of accommodation?

- a) 2.5 - 0.4 (3%) = 13 D
- b) 1.5 - 0.3 (3%) = 9.5 D
- c) 1.5 - 0.25 (3%) = 7.5 D

5. Using the rule that says to keep half the amplitude of accommodation in reserve, what add would you recommend for a patient who has an amplitude of accommodation of 2.25 D and a working distance of 38 cm?

\[
\begin{align*}
\frac{2.25}{2} & = 1.125 \\
\frac{1.125}{0.3} & = 3.75 \\
\text{Add} & = +1.50 \text{ D}
\end{align*}
\]

6. You prescribe +1.75/-1.75 D lens rock vision training to be done with a target at 40 cm. The patient has a 62 mm PD. What are the (a) accommodative stimulus and the (b) convergence stimulus on the minus side of the lens rock?

- a) \( \frac{2.50}{40} + 1.75 = 44.25 \text{ D} \)
- b) \( \frac{6.25}{40 + 2.7} = 411.52 \text{ D} \)
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Questions 7-12 are multiple choice questions. Circle the letter by the single best answer.

7. In which of the following case types is the treatment mentioned in question 6 most likely to be used?
   a. presbyopia
   b. convergence insufficiency
   c. basic exophoria
   d. accommodative inflexibility
   e. It would not be used in any of the above

8. Which of the following provides a measurement of the amount of the lag of accommodation?
   a. low neutral dynamic retinoscopy
   b. Nolt dynamic retinoscopy
   c. binocular cross cylinder
   d. all of the above
   e. none of the above

9. The positive relative accommodation test result can be limited by either:
   a. maximum relaxation of accommodation or positive fusional convergence
   b. maximum relaxation of accommodation or negative fusional convergence
   c. amplitude of accommodation or positive relative accommodation
   d. amplitude of accommodation or negative relative accommodation

10. In which of the following cases are you most likely to use Sheard's criterion?
   a. non-prebyopic with exophoria at near
   b. prebyopic with exophoria at near with nearpoint add
   c. non-prebyopic with exophoria at near
   d. prebyopic with exophoria at distance

11. You prescribe vision training for a patient with convergence insufficiency. Which of the following do you expect to show the greatest change?
   a. near phoria
   b. negative fusional convergence
   c. positive fusional convergence

12. In basic exophoria, the stimulus calculated ACA ratio is:
   a. low
   b. moderate
   c. high

Question number: points possible - points deducted = points scored

1: 4
2: 6 - 3 = 3
3: 5
4: 9
5: 5
Total: 100 - 2 = 98
22 yrs. old, complains of eye strain when reading and occasional near blur.

26 - 0.4 [22] = 16.2 D.

<table>
<thead>
<tr>
<th>Dist/Lens</th>
<th>Phoria</th>
<th>Base-In</th>
<th>Base-Out</th>
<th>NRA</th>
<th>PRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 m PVA</td>
<td>exo 75'</td>
<td>x/9/6</td>
<td>10/20/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 cm PVA</td>
<td>exo 35'</td>
<td>11/20/10</td>
<td>17/24/12</td>
<td>+2.25</td>
<td>-2.00</td>
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<tr>
<td>40 cm MAV 80</td>
<td>6 exo 75'</td>
<td></td>
<td></td>
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</tbody>
</table>

PD = 64 mm
Amplitude of accommodation = 9.8 D
Convergence amplitude = 80 A

MEM dynamic retinoscopy: with motion estimated at 1.25 D -0.25
accommodative facility (+2/-2): OD, 12 b/m; OS, 12 c/m; BU, 9 c/m
Log = +1.00
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Test results for patient HS:

28 yrs. old, complains of eye strain when reading and occasional near blur.

\[ \text{min } AB = 3.0 \]

<table>
<thead>
<tr>
<th>Distance</th>
<th>Phoria</th>
<th>Base-in</th>
<th>Base-out</th>
<th>NRA</th>
<th>FRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m/BOVA</td>
<td>ortho</td>
<td>X/8/4</td>
<td>12/18/10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40cm BVA</td>
<td>4 exo</td>
<td>12/22/10</td>
<td>18/24/12</td>
<td>+2.25</td>
<td>-2.00</td>
</tr>
<tr>
<td>40cm/BIAH</td>
<td>7 exo</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

PD = 62 mm  
Amplitude of accommodation = 9.0 D

Convergence amplitude = 74 Δ

Net dynamic retinoscopy: target at 40cm; neutral at 50 cm

accommodative facility (1/2): 0D, 7c/m; 05, 7c/m; OD, 5c/m

\[ \frac{5 \pm 2.7}{40+2.7} = 14.52 \]
13. Answer the following for patient FJ:

(a) Plot the graph.

(b) What is the lag of accommodation?

(c) What is your diagnosis?

(d) What test findings indicate that diagnosis?

(e) What treatment(s) do you recommend? If your treatment involves lens adds or prisms, give the powers.

\[
\begin{align*}
\text{c) & \text{ accommodative insufficiency having problems with accommodation.} \\
\text{d) & \text{ loss of amplitude of accommodation and high lag of accommodation.} \\
\text{e) & \text{ gives a } +3.25 \text{ add at near.} }
\end{align*}
\]

\[
\begin{align*}
41.25 \text{ add at near } +3.25 \text{ add at near } = 44.50 \text{ add.}
\end{align*}
\]

14. Answer the following for patient HS:

(a) Plot the graph.

(b) What is the calculated ACA ratio?

(c) What is the lag of accommodation?

(d) What is your diagnosis?

(e) What test findings indicate that diagnosis?

(f) What treatment(s) do you recommend? If your treatment involves lens adds or prisms, give the powers.

\[
\begin{align*}
\text{c) & \text{ accommodative insufficiency.} \\
\text{d) & \text{ accommodative instability.} }
\end{align*}
\]

\[
\begin{align*}
\text{e) & \text{ the lens needs to be more circular and less as amp of accommodation is low below average for her age, but still meets minimum.} } \\
\text{f) & \text{ stand pl on accm, facility exercise like a lower power lens role.} }
\end{align*}
\]