

1. E. Kameron

$$\begin{aligned}
 2. \quad A. 11 \text{ kuli} &\rightarrow M_{\text{max}} = PP/F + 1 \\
 &= 25/5/2 + 1 \\
 &= 10 + 1 = 11 \text{ kuli}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad B + 2,3 \text{ dropteri} &\rightarrow P = \frac{100}{S_n} - \frac{100}{S_n'} \\
 &= \frac{100}{25} - \frac{100}{60} = 4 - 1,67 = 2,3 //
 \end{aligned}$$

$$\begin{aligned}
 4. \quad D. 6 \text{ kuli} &\rightarrow M_{\text{max}} = \frac{S_n}{F} + 1 \\
 &= \frac{25}{5} + 1 = 6 \text{ kuli} //
 \end{aligned}$$

5. A. 40 cm x 50 cm \rightarrow E. delent

$$P = 4 - 100/PP$$

$$1,5 = 4 - 100/PP$$

$$100/PP = 2,5$$

$$PP = 40 \text{ cm}$$

E. jauh

$$P = -100/PR$$

$$-2 = -100/PR$$

$$PR = 50 \text{ cm}$$

$$\begin{aligned}
 6. \quad C. 28,6 \text{ cm} &\rightarrow P_1 = 100/S_{n1} - 100/PP \\
 2,5 &= 100/25 - 100/PP \\
 2,5 &= 4 - 100/PP \\
 100/PP &= 4 - 2,5 \\
 100/PP &= 1,5
 \end{aligned}$$

$$P_2 = 100/S_{n2} - 100/PP$$

$$2 = 100/S_{n2} - 1,5$$

$$100/S_{n2} = 2 + 1,5$$

$$100/S_{n2} = 3,5$$

$$S_{n2} = 100/3,5$$

$$= 28,57 \text{ cm} //$$

7. A. 2 kuli $\rightarrow M = S_n/F$

$$= 20/10 = 2 \text{ kuli} //$$

8. C. 4 cm $\rightarrow 1/s + 1/s' = 1/f$

$$1/s + 0 = 1/4$$

$$s = 4 \text{ cm} //$$

9. C. $7,25 \rightarrow P = \frac{100}{f}$

Pembesaran: $\frac{S_n}{P} + 1$

$25 = \frac{100}{f}$

$= \frac{25}{1} + 1$

$f = \frac{100}{25} = 4 \text{ cm}$

$= 6,25 + 1 = 7,25 \text{ kali}$

10. B. $12,5 \text{ dioptri} \rightarrow M = \frac{P}{f} + 1$
 $6 = \frac{90}{f} + 1$
 $\frac{40}{f} = 5$
 $f = 40/5$

$f = 8 \text{ cm} = 0,08 \text{ m}$

$P = 1/f$

$= 1/0,08$

$= 12,5 \text{ dioptri}$

12. C. $18,5 \text{ cm} \rightarrow S_{ok} = \frac{S_{ok} \cdot F_{ok}}{S'_{ok} - F_{ok}}$

$d_{mulis} = 11 + 17,5$

$S'_{ok} = F_{ok}$

$= 18,5 \text{ cm}$

$= \frac{(-30)(10)}{(-30) - (10)}$

$= \frac{-300}{-40} = 7,5 \text{ cm}$

13. C. $2,0 \text{ cm} \rightarrow L = S'_{ob} + F_{ok}$

$S'_{ob} = S_{ob} \cdot (S'_{ob} - F_{ob}) / F_{ob}$

$24 = S'_{ob} + 6$

$18 = S_{ob} \cdot (18 - 1,8) / 1,8$

$S'_{ob} = 18 \text{ cm}$

$18 = S_{ob} \cdot 5$

$S_{ob} = 2 \text{ cm}$

14. A (1) dan (2)

15. D. $S_0 \text{ kali} \rightarrow M_{total} = M_{ob} \cdot M_{ok}$

$= (S_{ob}' / S_{ob}) \cdot (S_n / f_{ok} + 1)$

$= (11 / 1,1) \cdot (25 / 5 + 1) = 60 \text{ kali}$

$M_{bidak, berakomodasi} = M_{ob} \cdot M_{ok}$

$= 11 / 1,1 \cdot 25 / 5 = 10,5 = 50 \text{ kali}$

16. B. 12 lens $\rightarrow \frac{1}{F_{ob}} = \frac{1}{S_{ob}} + \frac{1}{S'_{ob}}$
 $\frac{1}{S'_{ob}} = \frac{1}{F_{ob}} - \frac{1}{S_{ob}}$
 $\frac{1}{S'_{ob}} = \frac{S_{ob} - F_{ob}}{S_{ob} \cdot F_{ob}}$
 $S'_{ob} = \frac{S_{ob} \cdot F_{ob}}{S_{ob} - F_{ob}}$
 $M_{ob} = \frac{S'_{ob}}{S_{ob}} = \frac{S_{ob} \cdot F_{ob}}{(S_{ob} - F_{ob}) \cdot S_{ob}} = \frac{F_{ob}}{S_{ob} - F_{ob}}$
 $M_{ob} = \frac{1}{1,5 - 1} = \frac{1}{0,5} = 2$
 $M_{ok} = \frac{S_n}{F_{ok}} + 1$
 $M_{ok} = \frac{30}{6} + 1 = 5 + 1 = 6$
 $M_{tot} = M_{ob} \cdot M_{ok}$
 $= 2 \cdot 6 = 12 \text{ kali}$

17. E. 50 lens $\rightarrow S'_{ob} = \frac{(2,2)(10)}{2,2 - 2}$ $M_{ob} = \left| \frac{2,2}{2,2} \right| = 10 \text{ kali}$
 $= 22 \text{ cm}$ $M_{ok} = \frac{25}{5} = 5 \text{ kali}$

$M = M_{ob} \cdot M_{ok}$
 $= 10 \cdot 5 = 50 //$

18. A. 20 lens $\rightarrow \frac{1}{S'_{ob}} = \frac{1}{1,1} - \frac{1}{1,1}$ $d = S'_{ob} + S_{ok}$
 $\frac{1}{S'_{ob}} = \frac{1 - 10}{1,1}$ $S_{ok} = 10 - 11$
 $\frac{1}{S'_{ob}} = \frac{11 - 10}{1,1}$ $= 5 \text{ cm}$
 $S'_{ob} = 11 \text{ cm}$

$\frac{1}{S} + \frac{1}{S'_{ok}} = \frac{1}{10}$
 $\frac{1}{S'_{ok}} = \frac{1}{10} - \frac{2}{10}$
 $S'_{ok} = -10 \text{ cm}$

$M = \left(\frac{11}{1,1} \right) \left(\frac{10}{5} \right)$
 $= 10 \cdot 2$
 $= 20 \text{ kali} //$

19. B. 24 cm $\rightarrow \frac{1}{S_{ob}} = \frac{1}{1,8} - \frac{1}{2} = \frac{2}{3,6} = \frac{1,8}{3,6} = \frac{0,2}{3,6}$
 $S_{ob} = \frac{3,6}{0,2} = 18 \text{ cm}$
 $d = S_{ob} + F_{ok} = 18 + 6 = 24 \text{ cm}$

$$20. D \ 30 \text{ cm} \rightarrow \frac{1}{S'_{ob}} = \frac{1}{2} - \frac{1}{212} = \frac{11}{22} - \frac{10}{22} = \frac{1}{22}$$

$$S'_{ob} = 22 \text{ cm}$$

$$d = S'_{ob} + S_{dk} = S'_{ob} + f_{ok} = 22 + 8 = 30 \text{ cm} //$$

$$21. D \ 10 \text{ kali} \rightarrow \frac{1}{S'_{ob}} = \frac{1}{2} - \frac{1}{3} \quad M_{min} = \frac{6}{2} = 3 \times \frac{1}{6}$$

$$\frac{1}{S'_{ob}} = \frac{3}{6} - \frac{2}{6} \quad M_{min} = 2.5$$

$$\frac{1}{S'_{ob}} = \frac{1}{6} \quad M_{min} = 10 \text{ kali} //$$

$$S'_{ob} = 6 \text{ cm}$$

$$22. E \ 10 \text{ cm} \rightarrow S'_{ob} = 10 \left(\frac{8}{13-3} \right)$$

$$= 40 \text{ mm}$$

$$L = S'_{ob} + f_{ok}$$

$$= 40 \text{ mm} + 100 \text{ mm} = 140 \text{ mm} //$$

$$23. E \ 80 \text{ kali} \rightarrow \gamma = \frac{F_{ob}}{F_{ok}}$$

$$= \frac{80}{10} = 8 \text{ kali} //$$

$$24. B. \text{Apakah ada minimum 20 kali} \rightarrow M_{ok} = \frac{F_{ob}}{F_{ok}}$$

$$= \frac{120}{6} = 20 //$$

$$25. C \ 10 \text{ kali} \rightarrow d = F_{ob} + F_{ok} \quad M = \frac{F_{ob}}{F_{ok}}$$

$$F_{ok} = 110 - 100$$

$$= 10 \text{ cm}$$

$$= \frac{100}{10}$$

$$= 10 \text{ kali} //$$

$$26. B. 80 \text{ kali} \rightarrow M = \frac{F_{ob}}{F_{ok}}$$

$$F_{ok}$$

$$= \frac{160}{2} = 80 \text{ kali} //$$

$$27. D. 90 \text{ kali} \rightarrow M = \frac{-F_{ob}}{F_{ok}}$$

$$= \frac{-200}{5}$$

$$= 90 \text{ kali} //$$

28. A 10 kali $\rightarrow d = f_{ob} + f_{ok}$

11 $f_{ok} = f_{ob} + f_{ok}$

10 $f_{ok} = f_{ob}$

$M = f_{ob} / f_{ok}$

$= 10 \cdot f_{ok} / 10 \cdot f_{ok}$

$= 10 \times //$

29. A 1,0 cm $\rightarrow M = (s'_{ob} / s_{ob}) \cdot (s_n / f_{ok})$

$g_o = 10 s'_{ob} / s_{ob}$

$s'_{ob} \cdot g_o / 10 = g \text{ cm}$

$1 / v_{og} = 1 / g s_{ob} + 1 / s_{ob}$

$1 / v_{og} = 1 / g s_{ob} + g / g s_{ob}$

$1 / v_{og} = 10 / g s_{ob}$

$g s_{ob} = 10 \cdot 0,9$

$g s_{ob} = 9$

$s_{ob} = 1 \text{ cm} //$

30. d 70 cm $\rightarrow d = f_{ob} + 4 \cdot f_P + f_{ok}$

$= 40 + (4 \cdot 5) + 10 = 70 \text{ cm} //$

31. d 2,0 cm $\rightarrow P_{ob} = r \cdot 100 / f_{ob}$

$r \cdot 0,5 = r \cdot 100 / f_{ob}$

$f_{ob} = 200 \text{ cm}$

$P_{ok} = -160 / f_{ok}$

$-5 = -100 / f_{ok}$

$f_{ok} = -100 / -5$

$f_{ok} = 20 \text{ cm}$

$f_{ob} / f_{ok} = d' / d$

$200 / 20 = 20 / d$

$10 = 20 / d$

$d = 2 \text{ cm} //$