PHYSICS

11. (1)
For spherical mirrors
m = +ve→ virtual image
m = –ve→ real image
m > 1 → magnified image
m < 1 → diminished image

12. (1)
Let focal length of convex lens
$= f_1 = f$(suppose)
f_2 = focal length of concave lens $= \frac{-3f}{2}$
Equivalent focal length = 30 cm
$\therefore \frac{1}{30} = \frac{1}{\frac{f-2}{3f}}$
Focal lengths are −15 cm (concave lens) and 10 cm (convex lens)

13. (3)
In figure (3), both the curved surfaces have same R on the same side. Hence no dispersion is exhibited
For lens, $\frac{1}{f} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$
For no dispersion $d\left(\frac{1}{f}\right) = 0$
$0 = (d\mu)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ or $R_1 = R_2$

14. (3)
No refraction will occur when ray travels from P to Q or Q to R because P', Q, R are made of same material. They are all identical prisms

15. (1)
Wavelength $(\lambda) = \frac{\text{velocity(v)}}{\text{frequancy(f)}}$
When the ray of light travels from air to glass, f remains unchanged while velocity (v) decreases hence wavelength λ should decrease.

16. (2)

17. (2)

18. (2)
$R = \frac{\Delta V}{\Delta I} = \frac{2}{10 \times 10^{-13}}\Omega = 0.2\,\Omega$

19. (1)

20. (1)