PHYSICS

11. Match the corresponding entries of Column-1 with Column-2 (where m is the magnification produced by the mirror)
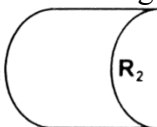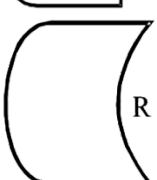
Column - I		Column- II	
A	m = –2	1	Convex mirror
B	$m = -\dfrac{1}{2}$	2	Concave mirror
C	m = +2	3	Real image
D	$m = +\dfrac{1}{2}$	4	Virtual image

(1) A → (2) and (3), B → (2) and (3) → C → (2) and (4), D → (1) and (4)

(2) A → (1) and (3), B → (1) and (4) → C → (1) and (2), D → (3) and (4)

(3) A → (1) and (4), B → (2) and (3) → C → (2) and (4), D → (2) and (3)

(4) A → (3) and (4), B → (2) and (4) → C → (2) and (3), D → (1) and (4)

12. A convex lens is in contact with concave lens. The magnitude of the ratio of their focal lengths is 2/3. Their equivalent focal length is 30 cm. what are their individual focal lengths?

(1) –15, 10   (2) –10, 15
(3) 75, 50   (4) –75, 50

13. Which one of the following spherical lenses done not exhibit dispersion? The radii of curvature of the surfaces of the lenses are as the lenses are as given in the diagrams.

(1) R_1 ( ) R_2

(2) R ( ) ∞

(3) R ( ) R

(4) R) ∞

14. A given ray of light suffers minimum deviation in an equilateral prism P. Addition

prism Q and R of identical shape and of the same material as P are now added as shown in the figure. The ray will now suffer
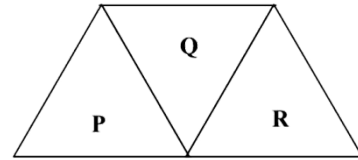

(1) greater deviation
(2) no deviation
(3) same deviation as before
(4) total internal reflection

15. When a ray of light enters a glass slab from air
(1) its wavelength decreases
(2) its wavelength increases
(3) its frequency increases.
(4) neither its wavelength nor its frequency changes

16. In figure V_0 is the potential barrier across a p-n junction, when no battery is connected across the junction
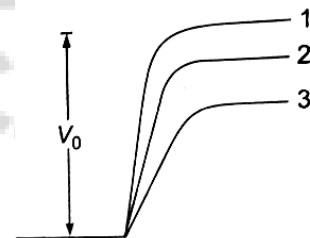
(1) 1 and 3 both correspond to forward bias of junction
(2) 3 corresponds to forward bias of junction and 1 corresponds to reverse bias of junction
(3) 1 corresponds to forward bias and 3 corresponds to reverse bias of junction
(4) 3 and 1 both correspond to reverse bias of junction

17. In figure assuming the diodes to be ideal:
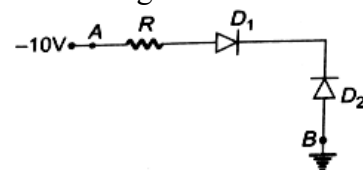
(1) D_1 is forward biased and D_2 is reverse biased and hence current flows from A to B

(2) D_2 is forward biased and D_1 is reverse biased and hence no current flows from B to A and vice-versa

(3) D_1 and D_2 are both forward biased and hence current D flows from A to B

(4) D_1 and D_2 are both reverse biased and hence no current flows from A to B and vice-versa

18. The resistance of a germanium junction diode whose shown in figure is
($V_k = 0.3$ V) is

(1) 5 kΩ

(2) 0.2 kΩ

(3) 2.3 kΩ
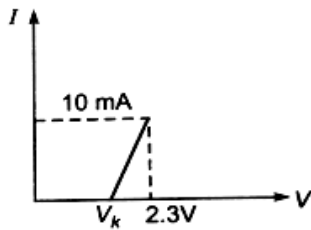
(4) $\left(\dfrac{10}{2.3}\right)$ kΩ

19. In semiconducting material the mobilities of electrons and holes are μ_e and μ_h respectively. Which of the following is true?

(1) $\mu_e > \mu_h$

(2) $\mu_e < \mu_h$

(3) $\mu_e = \mu_h$

(4) $\mu_e < 0$, $\mu_h > 0$

20. The given graph represents V-I characteristic for a semiconductor device. Which of the following statements is correct?
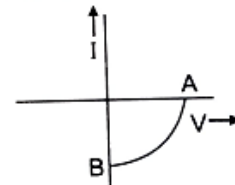
(1) It is V-I characteristic for solar cell where, point A represents open circuit voltage and point B short circuit Current.

(2) It is for a solar cell and point A and B represent open circuit voltage and current, respectively

(3) It is for photodiode and points A and B represent open circuit voltage and current, respectively

(4) It is for a LED and points A and B represent open circuit voltage and short circuit current, respectively