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Name :- Hemil Chovatiya

E.No :- T0120IT219

Branch :- Information Technology

Division :- IT 3

Institute :- PIET

1) Gallium Arsenide (GaAs) - Infrared.
780 nm to 1 mm.

E_g (Band gap) = 1.3 V

$h = 6.6 \times 10^{-34}$.

$c = 3 \times 10^8$ m/s.

$$E = \frac{hc}{\lambda}$$

$$0.013 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 955 \text{ nm}$$

2) Gallium Arsenide Phosphide (GaAsP) :-
590 to 960 nm.

$E_g = 1.881$ - Red to Infra-red; Orange

$$E_g = \frac{hc}{\lambda}$$

$$0.01881 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 660 \text{ nm}$$

3) Aluminum Gallium Arsenide Phosphide.
(AlGaAsP)
560 nm to 700 nm
(High Brightness red, orange-red, orange and yellow)

$E_g = 1.882$ V

$$E_g = \frac{hc}{\lambda}$$

$$0.01825 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 680 \text{ nm}$$

4) Gallium phosphide (Ga P) :- Red, yellow and green.

$E_g = 2.25\ V$ $\quad$ $520 - 700\ nm$

$$E_g = \frac{hc}{\lambda}$$

$$0.0225 \times 10^2 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 550\ nm$$

5) Alluminium Gallium phosphide (Al-Ga-P)

$E_g = 2.175\ V$ $\quad$ Green $\quad$ $520 - 570\ nm$

$$E_g = \frac{hc}{\lambda}$$

$$0.02175 \times 10^2 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 570\ nm$$

6) Gallium Nitride (Ga-N) Green, Emerald Green

$E_g = 2.25$ $\quad$ $520 - 560\ nm$

$$E_g = \frac{hc}{\lambda}$$

$$0.0225 \times 10^2 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\lambda = 550\ nm$$

7) Gallium Indium Nitride (Ga-InN)

near Ultraviolt, blush green and blue, $100 - 550\ nm$

$E_g = 2.75\ V$

$$0.027 \times 10^2 \times 1.6 \times 10^{-19} = \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{\lambda}$$

$$\boxed{\lambda = 450\ nm}$$