General Viva-voce & questions

1. LASER Acronym ⇒ ~~Laser A~~

Light Amplification by Stimulated Emission of Radiation

2. Properties (or) Characteristics of Laser over ordinary light

i) monochromatic ii) coherent

iii) High directionality iv) High Intensity

3) Diode? ⇒ It is a device consists of 2 electrodes namely anode & cathode

4) Input and output of LASER & LED Diode ⇒

Electrical energy into Light Energy

5) Diffraction ⇒ bending of light beams

6) Grating ⇒ Glass material & consists of number of vertical straight lines

[2500 lines/inch; 98425 lines/m]

7) Optical fiber? cylindrical dielectric light guiding medium

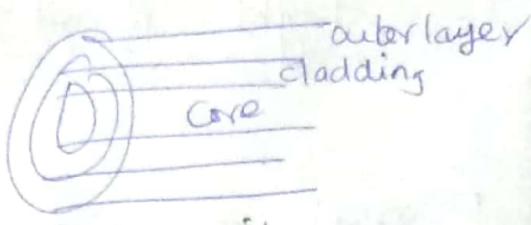
8) Principle of optical fibre: Total Internal Reflection

Two conditions

i) $n_1 > n_2$ n_1 - refractive index of core

ii) $\theta_i \geq \theta_c$ n_2 - r.i. of cladding

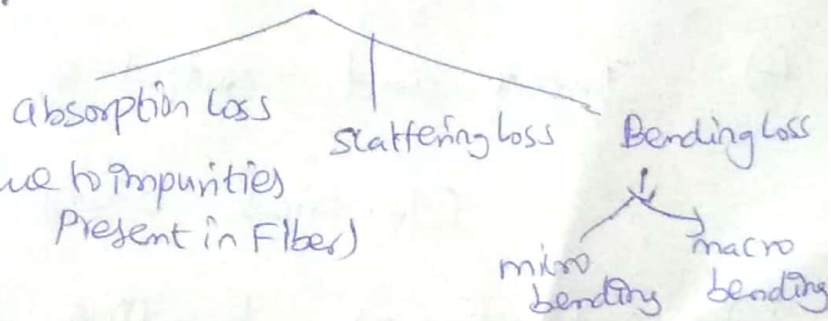
9) Construction of OF



10) Two light sources for OF : i) LASER
ii) LED

11) ~~Loss~~ → Numerical aperture : light gathering ability of OF cable

12) Loss in OF : Light signal loss in amplitude is called attenuation



13) Energy band gap is called as energy difference between Conduction band and valence band

$$E_g = E_c - E_v \qquad E_g = \frac{hc}{\lambda} \text{ eV}$$

14) Principle of LASER ⇒ Stimulated emission (read def)
Principle of LED ⇒ Electroluminescence

15) Difference b/w normal p-n junction diode and LED, LASER Diode

Normal diode is made up of Indirect band gap semiconductors Ex: Ge, Si

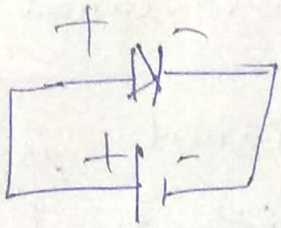
LED, LASER is made up of Direct Band gap Ex: GaAs

16) LED different colours — By varying the impurity concentration and selecting the material

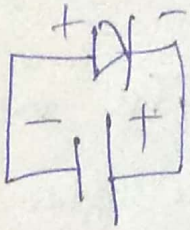
17) LED — Converting Electrical energy into optical energy

18) LED & LASER Diode ⇒ working under forward biased condition

Forward Bias



Reverse bias



19) threshold voltage: The voltage at which the diode starts to conduct the electricity or remove the potential barrier in p-n junction
(or) Knee voltage

20) Eg of 'Si' = 1.1 ev , Eg of 'Ge' = 0.7 ev

21) photodiode ⇒ converts Light energy into electrical energy under reverse biased p-n junction

22) Total current in the photodiode = dark current + Photo current

$$I_T = I_d + I_p$$

(without light) (with light)

[App optical communication system]

23) Solar cell ⇒ converts ~~Electrical en~~ Light energy into electrical energy

⇒ operating in ~~photoconductor~~ photovoltaic mode

24) Indirect band gap Semiconductor are used to fabricate the solar cell.

25) Open circuit voltage (V_{oc}):

The maximum voltage is delivered by the solar cell with Load resistance [R_L]

Short circuit current density (I_{sc}).

The maximum current is delivered by the solar cell without load resistance(R_L)

26) Fill Factor: measure the quality of the Solar cell

Prepare more questions from Lab manual also

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