

## Practical Laser

- 1- For a Gaussian beam propagating in free space, the spot size  $w(z)$  will be at a minimum value  $w_0$  at one place along the beam axis, known as the beam waist
- 2- What is depth of focus of the laser beam mean .
- 3- What is meant by  $1/e^2$  beam width for Gaussian profile?
- 4- Why knowledge of photo-detectors and their use is extremely important for the laser technician.
- 5- What is the responsivity of the photodetector .
- 6- Define quantum efficiency of photodetector.
- 7- Write about "response time", Rise time
- 8- Why we need to focus the beam of the laser?
- 9- what is the effect of
  - i. Beam expander in the value of speed penetration and cutting?
  - ii. The thickness of the sample on  $V_p$  &  $V_c$ .
- 10- mention the application of refractive index in medicine.
- 11- Why do we use the laser beam to calculate the distance?
- 12- What is the principle of operation of an optical fiber.
- 13- Why are fiber-optic cables used in communications,
- 14- What are the differences between single and multi-mode fiber optic cable.
- 15- Write about the cutback method
- 16- Why the core region has a refractive index larger than the refractive index of the cladding region?
- 17- In an optical fiber, the concept of numerical aperture is applicable in describing the ability of -----
  - a- Light collection
  - b- light Scattering
  - c- light Dispersion
  - d- light polarization
- 18- Laser pulses can be generated by *Q switching* , ----- and -----.
- 19- Define **pulse repetition time**, **pulse repetition rate**, **"duty cycle"** .
- 20- What is the reason for laser beam divergence?

- 21- What is the main property of the He-Ne laser?
- 22- A laser has a divergence of 0.2 milliradians (mrad):
- a. If the beam cross-section is circular, what is the solid angle of the beam?
  - b. If the power of the beam is 5 mW, what is the intensity of a point at 2 m distance from the laser?
- 23- Define Lambert and Beer's Law.
- 24- Write about step-index fiber.
- 25- What is the Numerical Aperture (NA) mean .
- 26- Write about Medical Applications of LDV .