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-   Why do we use the laser beam to calculate the distance?
11-   What is the principle of operation of an optical fiber.
12-   Why are fiber-optic cables used in communications,
13-   What are the differences between single and multi-mode fiber optic cable.
14-   Write about the cutback method
15-   Why the core region has a refractive index larger than the refractive index of the cladding region?

16- 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

17- Laser pulses can be generated by *Q switching* , ---------------- and   ---------------.

18-   Define **pulse repetition time**, **pulse repetition rate**, "**duty cycle**" .
19-   What is the reason for laser beam divergence?

20- What is the mean property of the He-Ne laser?

21- A laser has a divergence of 0.2 mill radians (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?

22- Define Lambert and beer Law.

23- Write about step-index fiber.

24- What is the Numerical aperture (NA) mean .

25- write about Medical Applications of L D V .