**SET I SEC Applied Optics SEM IV**

**Group A Objective question 10x2=20**

1.Laser action cannot take place in:

**a)** two level system b) three level system c) four level system d) all of the above

2. Laser action is most efficient in:

a) two level system b) three level system c) four level system d) all the above

3. Which of the following has the important role in laser transition:

a) free electron b) bound electron c) free neutrons d) nuclei

4. Which level must have longer life time in laser action in three level schemes?

a) ground energy level b) first excited level c) second excited level d) third excited level

5. Ruby laser gives:

a) Continuous wave output b) pulsed output c) both above d) none

6. Helium –neon laser is:

a) two level laser b) three level laser c) four level laser d) none of the above

7. Optical fiber uses the phenomenon of:

a) Reflection b) refraction c) total internal reflection d) interference

8. In stimulated emission, which among the following parameters of generated photon is/are similar to the photon of incident wave?

a) Phase b) frequency c) polarization and direction of travel d) all of the above.

9. Which among the following id described by the concept of numerical aperture in an optical fibre?

a) light collection b) light scattering c) light dispersion d) light polarization

10. If a light travels in a certain medium and it gets reflected off an optically denser medium with high refractive index, then it is regarded as

a) external reflection b) internal reflection c) both a&b d) none of the above

**Group B very short answer type.** 4x5=20

11. Write three characteristics of laser light.

12 What is holography?

13. What are the types of optical fiber?

14. What do you mean by acceptance angle in fiber optics?

**Group C Short answer type 1x10=10**

15. Why laser beam is used as a light source in optical communication?

16.describe the working of He-Ne laser.

**SET II SEC Applied Optics SEM IV**

1. The technique by which image is obtained from a hologram is called as

a) formation b) construction c)reconstruction d) projection

2. which of the following is used for the formation of holograms?

a) X-rays b) visible light c) infrared d) lasers

3. Holography is based on the principle of

a) interference b) diffraction c) interferometer d) polarization

4. The principle of generation of the wave front from an object from a hologram can be used for

a) Data storage b) transient microscopy c) interferometry d) pattern reorganization

5. The holograms found on credit-card are an example of

a) Volume hologram b) rainbow hologram c) reflection hologram d) hybrid hologram

6. Fourier transform NMR spectrometer allows NMR transition to be observed simultaneously

a)true b) false

7. Fourier transform NMR spectrometer has which of the following characteristics?

a) Increased sensitivity, long time to obtain data b) decreased sensitivity, long time to obtain data c) increased sensitivity, reduced time to obtain data d) decreased sensitivity , reduced time to obtain data

8. Two coils are necessary for Fourier transform NMR spectroscopy.

a) true b) false

9. Fourier transform can be accomplished by using which of the following components?

a) spin decoder b) detector c) spectrum analyzer d) oscilloscope

10. Mode locking in laser means production of pulses:

a) in same phase b) of same amplitude c) both above d( none of the above.

**Group B very short answer type.** 4 x 5 = 20

11. Define Meta stable state.

12. What are the losses that occur during optical fiber communication?

13. What are the conditions of total internal reflection?

14. What is the basic principle of NMR?

**Group C Short answer type 1x10=10**

**15**. What is the use of laser in holography?

16.Explain the terms: spontaneous and stimulated emission.