**22PHP312**

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**MSc DEGREE EXAMINATION DECEMBER 2023**
(Third Semester)

Branch – **PHYSICS**

**PHOTONICS AND APPLICATIONS**

Time: Three Hours Maximum: 50 Marks

**SECTION-A (5 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 Which of the following is not the property of LASER Light?
(i) Coherence (ii) Chromaticity
(iii) High intensity (iv) Directionality

2 Pumping is done in order to achieve
(i) Steady state (ii) Population inversion
(iii) Equilibrium (iv) Photon emission

3 $CO_2$ laser was first designed by .....
(i) T.maiman (ii) H.M.patel
(iii) Gapoor (iv) J.M.Bose

4 Which characteristics of LASER allows it to be used in holography?
(i) Coherency (ii) Directionality
(iii) Intensity (iv) monochromaticity

5 LCD TV work on the principle of .....
(i) Light blockage (ii) Light emission
(iii) Laser (iv) CRT

**SECTION - B (15 Marks)**
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 (a) What is meant by coherence in laser light?
OR
(b) Which gives the special characteristics for laser light?

7 (a) Why laser emission is not obtained in a atomic system under thermal equilibrium?
OR
(b) What is meant by laser action? What are the conditions to achieve it?

8 (a) Calculate the wavelength of emission from Ga As whose band gap is 1.44 eV.
OR
(b) Mention the important semiconductor used in LASER.

9 (a) What is holography?
OR
(b) Which type of lasers are used in industry and medical field?

**Cont...**

10 (a) Compare LCD and LED displays.

OR

(b) What is meant by fluorescence?

**SECTION -C (30 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 (a) Distinguish between stimulated emission and spontaneous emission.

OR

(b) Explain the properties of ordinary light and Laser light.

12 (a) Explain the principle of laser action.

OR

(b) Explain the optical resonator.

13 (a) Describe the construction and working of He- Ne laser.

OR

(b) Describe the construction and working of $CO_2$ laser.

14 (a) Write the applications of holography.

OR

(b) Write the laser in medical applications.

15 (a) Explain the basic principle of LED.

OR

(b) Write the general properties of LCD.

Z-Z-Z

END