M.Sc. (Physics)(with Credits)-Regular-Semester 2012 Sem III

MSc231012 - Elective-I Paper-XII : Lasers, Fibre, Optics and Applications

P. Pages : 1 **GUG/S/18/3502**

Time : Three Hours * 0 6 8 4 * Max. Marks : 80

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1. Either

a) Explain Gaussian beam and its properties. **8**

b) Explain various mode in laser cavity. **8**

OR

e) What is meant by mode selection? Explain its method. **8**

f) Explain Gain in the regenerative laser cavity. **8**

2. Either

a) Describe the working of three level laser system to get high power output of the laser beam. **8**

b) Derive an expression of optimum output power of four level laser system. **8**

OR

e) Describe construction and working of semiconductor laser with neat labeled diagram. **8**

f) Explain construction and working of Ruby laser. **8**

3. Either

a) Explain Diode pump solid state laser with neat labeled diagram. **8**

b) Describe construction and working of Nitrogen laser. **8**

OR

e) Discuss high power laser system and its application. **8**

f) Explain Dye lasers and its application with example. **8**

4. Either

a) What is Fluorescence? Explain its use in pollution studies. **8**

b) Discuss Raman Scattering and its use in pollution studies. **8**

OR

e) Explain the application of ultra high resolution spectroscopy with laser. **8**

f) Discuss various applications of laser induced multiphoton process. **8**

5. Answer all the following questions.

a) What is Q of the laser cavity? **4**

b) Explain the working of Nd YAG laser. **4**

c) Explain various industrial applications of laser. **4**

d) Explain in brief non linear interaction of light with matter. **4**

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