Q. P. Code : 39929

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. **Question no 1 is compulsory.**
2. Answer **Any 3** out of remaining **5** questions.
3. Figures to right indicate full marks**.**
4. Draw neat diagrams wherever necessary.

Q.1
a) Explain the Properties of Laser **(05)**
b) What is the significance of Acceptance angle and NA in fiber optics? **(05)**
c) Explain Snell's Law. **(05)**
d) Define what an Endoscope is? **(05)**

Q.2
a) Explain the construction and working of Ruby Laser along with its energy level diagram, mention some of its medical applications also. **(10)**
b) Explain the Optical fiber fabrication techniques, how is OVPO different from VP AD? Explain OVPO in detail. **(10)**

Q.3
a) Explain the primary element of Fiber Optic System. **(04)**
b) Explain in detail the Interaction of Laser with matter. **(08)**
c) Explain the Modes in Laser. **(08)**

Q.4
a) What is the importance of Safety while dealing with Laser? How is it achieved? **(04)**
b) Calculate the refractive indices of the core and the cladding material of an optic fiber whose numerical aperture is 0.35 and relative refractive index is 0.01. **(06)**
c) Draw and explain the flow diagram for Laser Angioplasty. **(10)**

Q.5
a) Explain in detail the attenuation in Optical Fibers. **(08)**
b) Explain the anatomical structure of a flexible endoscope and label all the parts, enlist the accessories come along with a flexible endoscope? Give their applications. **(12)**

Q.6 Write short note on **(any four)** **(20)**
a) Endoscopic Laser Photocoagulation
b) Optical fiber Splices
c) Trouble shooting in Endoscopy
d) Rigid Endoscope and its applications
e) Types of Laser Cavity

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