

IV B.Tech. I Semester Regular Examinations, November -2005
LASER AND FIBER OPTICS IN MEDICINE
(Bio-Medical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss in briefly the optical pumping methods.
(b) What do you mean directionality of laser?
(c) What do you mean coherence?
(d) Discuss the intensity of laser with a sketch. [4+4+4+4]
2. (a) Explain the importance of mono chromaticity and directionality in laser interaction with bio molecules.
(b) Explain different process of photo biological laser. [8+8]
3. (a) Explain briefly the non ablative tissue effects with neat diagram.
(b) Explain various types of laser tissue interaction with suitable diagram. [8+8]
4. How the light is transmitted from the source to the point of observation in side the human body and how the backscattered light is viewed. Explain with suitable sketch.

[16]
5. Compare fiber as a means of transmitting information with the conventional copper conductor, bringing out the advantage of using fiber in place of copper. Mention characteristics of fiber, which enable its extensive used in medical field. [16]
6. (a) Explain in detail the use of CO_2 laser in surgery.
(b) Explain with block diagram of ND – YAG laser use in laser surgery. [8+8]
7. (a) Explain with neat sketch induced carrier inhibition density during treatment of dental
(b) Explain difference between soft tissue and hard tissues of teeth. [8+8]
8. Explain in detail the different Hazards occurred during laser treatment with respect to Eye.

[16]

IV B.Tech. I Semester Regular Examinations, November -2005
LASER AND FIBER OPTICS IN MEDICINE
(Bio-Medical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss in briefly the optical pumping methods.
(b) What do you mean directionality of laser?
(c) What do you mean coherence?
(d) Discuss the intensity of laser with a sketch. [4+4+4+4]
2. (a) Explain in detail the principle behind the photo medicine.
(b) Explain in detail the principles of photobiology. [8+8]
3. (a) Discuss laser tissue interaction in detail.
(b) Discuss in detail the ablation of tissue. [8+8]
4. How the light is transmitted from the source to the point of observation in side the human body and how the backscattered light is viewed. Explain with suitable sketch.

[16]
5. Compare fiber as a means of transmitting information with the conventional copper conductor, bringing out the advantage of using fiber in place of copper. Mention characteristics of fiber, which enable its extensive used in medical field. [16]
6. (a) Explain all the properties of laser. Explain how laser surgery is different from conventional surgery.
(b) Explain in detail the use of laser in treatment of surface vascular lesion and Epithetical lesion. [8+8]
7. (a) Explain the difference types of the diseases of teeth.
(b) Explain how to use laser in treat of dentistry. [8+8]
8. (a) Explain in detail thermal Hazard occur during laser treatment.
(b) Explain in detail safety regulation to adopt during laser treatment. [8+8]

**IV B.Tech. I Semester Regular Examinations, November -2005
LASER AND FIBER OPTICS IN MEDICINE
(Bio-Medical Engineering)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) Discuss in briefly the optical pumping methods.
(b) What do you mean directionality of laser?
(c) What do you mean coherence?
(d) Discuss the intensity of laser with a sketch. [4+4+4+4]
2. (a) Explain the various degrees of laser interaction with bio molecules.
(b) Describe in detail of laser instrument for bio medical application. [8+8]
3. (a) Explain the biological function of a human cell.
(b) Describe how the cell structure can be investigated by using laser. [8+8]
4. (a) Explain different types of Endoscopes.
(b) Explain different optical sensors used in medicine. [8+8]
5. (a) Discuss in detail the basic principles and advantages of optical fibers.
(b) Classify the optical fiber on the basis of materials, modes of propagation and refractive index differences. [8+8]
6. (a) Discuss the fundamental modes of vibration of the CO_2 molecules.
(b) Explain the energy level diagram of CO_2 laser. [8+8]
7. Explain the different types of laser used in dentistry with a neat block diagram. [16]
8. (a) Explain in detail thermal Hazard occur during laser treatment.
(b) Explain in detail safety regulation to adopt during laser treatment. [8+8]

IV B.Tech. I Semester Regular Examinations, November -2005
LASER AND FIBER OPTICS IN MEDICINE
(Bio-Medical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss in briefly the optical pumping methods.
(b) What do you mean directionality of laser?
(c) What do you mean coherence?
(d) Discuss the intensity of laser with a sketch. [4+4+4+4]
2. (a) Discuss the principles of laser applications in molecular biology.
(b) Discuss in detail the study of bio molecules through the laser-excited fluorescence. [8+8]
3. (a) Explain the biological function of a human cell.
(b) Describe how the cell structure can be investigated by using laser. [8+8]
4. (a) Discuss the application of Endoscopes.
(b) Explain in detail flexible fiber optic gastro scopes with a neat diagram. [8+8]
5. (a) Discuss some of the applications optical fibers in medical field.
(b) What are the conditions to be satisfied for total internal reflection in optical fiber. [8+8]
6. (a) Explain the photo thermal application of laser in surgery.
(b) Explain the photo chemical application of laser in surgery. [8+8]
7. (a) Explain in detail the effects of laser on dental soft tissues.
(b) Explain the type laser used in treatment of dental soft tissues. [8+8]
8. Explain in detail the different Hazards occurred during laser treatment with respect to Eye.

[16]
