Registration No: | | | | | | | | | | |

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M.TECH
EIPE108

1st Semester Regular/Back Examination – 2014
FIBRE OPTIC AND LASER INSTRUMENTATION
BRANCH(S): APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING, ELECTRONICS & INSTRUMENTATION ENGINEERING

Time: 3 Hours
Max Marks: 70

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

a) What is acceptance angle?
b) How the photon detector works? Explain with example.
c) Explain briefly any two industrial application of optical fiber.
d) Distinguish between intrinsic and extrinsic absorption.
e) Write down the principle and types of electro-optic modulator.
f) What are holographic components?
g) What are the advantages of gas laser over the solid state laser?
h) What do you mean by population inversion? Why does it necessary?
i) List the medical applications of LASER.
j) What is cavity dumping?

Q2 a) Explain the various types of fiber optic losses in detail. (5)
b) Explain different types of modulators used in fiber optic instrumentation system. (5)

Q3 a) Explain the characteristics of optical sources and detectors. (5)
b) Briefly explain fiber optic gyroscope. (5)

Q4 a) Describe in detail the principle of measurement of pressure and level using fiber optic sensors. (5)
b) Differentiate three level lasers from four level lasers. (5)

Q5 a) Explain briefly the three processes involved in the laser action. Why population inversion cannot be attained in a two level scheme. (5)
b) How does laser light differ from a filament lamp? (5)

Q6 a) What is Q-switching? Explain the techniques for Q-switching. (5)
b) With neat diagram explain the working of semiconductor laser. (5)

Q7 a) Discuss holography for non-destructive testing. (5)
b) Discuss any two medical applications of laser. (5)

Q8 Write Short Notes (Any Two) (5 x 2)

a) Avalanche photo diode
b) Optical Resonator
c) Mode locking
d) Measurement of distance and velocity using laser
e) Application of laser for plastic surgery