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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **IN453UB - Professional Elective-V-Fiber Optics And Laser**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any Three subquestions

- a) Define following terms with respect to optical laws – [6]
- A) Reflection
 - B) Refraction
 - C) Refractive index
 - D) Snell's law
 - E) Critical angle
 - F) Total internal reflection (TIR)
- b) Explain the following – [6]
- A) Step index fiber
 - B) Graded index fiber
- c) What is meant by bending loss? Explain macro bending and micro bending. [6]
- d) Explain the structure of surface-emitting and edge-emitting LEDs. [6]

2) Solve any three subquestions

- a) Explain Fiber Optic communication System [6]
- b) Describe OTDR and its applications [6]
- c) What are the advantages of optical sensors? Explain types of optical fiber sensor [6]
- d) Briefly explain the importance of a link power budget. How the loss is calculated, explain with the optical power loss model? [6]

3) Solve any two subquestions

- a) Explain the principle of laser action. Explain also the spontaneous and stimulated emission process. [6]
- b) Compare the parameters of LED and LASER diode [6]
- c) Explain Three-level and four-level lasers [6]

4) Solve all subquestions

- a) Explain laser application in voltage and current measurement [6]
- b) Explain holography and its uses [6]

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