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B. E. (Eighth Semester) Examination, 2020

APR-MAY

(New Scheme)

(AEI & EI Branch)

OPTICAL INSTRUMENTATION

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) is compulsory in each question. Attempt any two out of part (b), (c) and (d) in each question.

Unit-I

1. (a) Write down some properties of Optical Fibers. 2
- (b) Explain in details principle of light propagation through a fiber. 7

- (c) Enlist the comparison among absorption, scattering & micro bending losses in optical fibers. 7
- (d) What are the sources & detectors used in opticals? Explain any one in details. 7

Unit-II

2. (a) Write down some industrial applications of optical fibers. 2
- (b) Explain in details measurement of length in optical fibers using interferometric method. 7
- (c) Describe the fiber optics gyroscope for measurement of rotation rate with various applications. 7
- (d) Write short notes on : 7
- (i) Measurement of temperature using optical fiber
 - (ii) Measurement of liquid level using optical fiber

Unit-III

3. (a) What do you mean by population inversion in LASER? 2

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- (b) Write short notes on : 7
- (i) Q switching
 - (ii) Mode locking
- (c) Explain in details about GAS LASER. 7
- (d) What do you understand by Three level & Four level LASERS? Explain in details. 7

Unit-IV

4. (a) List the advantages of LASER for industrial application. 2
- (b) Explain the measurement of distance using LASER. 7
- (c) Write short notes on : 7
- (i) LASER heating
 - (ii) LASER welding
- (d) What are the Atmospheric effect observed in industrial application of LASER? Explain in details. 7

Unit-V

5. (a) Write down some medical application of LASER. 2

- (b) What do you understand by "HOLOGRAPHY"?
Explain basic principle & applications. 7
- (c) Describe the procedure for removal of tumors of
vocal cords. 7
- (d) How we can use holography for non destructive
testing? 7