Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: AE409

Course Name: OPTICAL INSTRUMENTATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1	a)	Explain the principle of operation of LED.	(4)
	b)	A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and cladding refractive index of 1.47.Determine critical angle at the core and numerical aperture.	(4)
	c)	What are the advantages of APD over PIN diode? Explain about APD with neat sketch.	(7)
2	a)	Explain splicing techniques with neat diagram.	(8)
	b)	How optical fiber is produced using modified chemical vapour deposition?	(7)
3	a)	Explain the measurement of temperature using fiber optic sensors.	(7)
	b)	Explain the working of fiber optic gyroscope.	(8)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Explain the working of Michelson interferometers. How distance can be measured using Michelson interferometers?	(10)
	b)	What are interference filters?	(5)
5	a)	Give the principle of Q switching. Explain any one method of Q switching.	(7)
	b)	Explain any two types of solid state lasers.	(8)
6	a)	Give Einstein's relations.	(5)
	b)	Explain the principle of operation of lasers.	(3)
	c)	Explain with block diagram optical spectrum analyzer.	(7)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Explain laser doppler anemometry.	(8)
	b)	Explain the use of laser in material processing.	(12)
8	a)	Explain laser tissue interactions.	(10)
	b)	Discuss the application of laser in Ophthalmology.	(10)
9	a)	Briefly describe how laser can be used in distance measurement.	(10)
	b)	How cancer can be treated optically?	(10)

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