Reg No.:_____ Name:_____

03000ME312052002

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth semester B.Tech degree examinations (S), September 2020

Course Code: ME312

Course Name: METROLOGY AND INSTRUMENTATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1	a)	Distinguish between relative error and random error.	(4)
	b)	Explain how the measurements are made with universal bevel protractor.	(4)
	c)	Write any two precautions to be followed when using a gauge block.	(2)
2	a)	Explain briefly the construction and working of a height gauge.	(5)
	b)	Explain with the help of a diagram the principle of a sine bar.	(5)
3	a)	Differentiate hole basis and shaft basis systems of tolerance, which system is used most and why?	(6)
	b)	Explain the following gauges (1) snap gauges (2) plug gauges	(4)
4	a)	Write any four characteristics of Laser.	(4)
	b)	Describe the working of optical flat with neat sketch.	(4)
	c)	State the principle of interferometry.	(2)

PART B

Answer any three full questions, each carries 10 marks.

5	a)	Discuss the procedure involved in a profile projector to project the images.	(4)
	b)	Explain the measurement of major and minor diameters of a screw thread.	(6)
6	a)	With the help of a neat sketch describe the working of a profilometer.	(5)
	b)	Explain the principle and working of Autocollimator.	(5)
7	a)	Discuss any two alignment tests carried out in lathe machine with neat sketch.	(6)
	b)	List the various geometrical checks made on machine tools	(4)
8	a)	What are the four basic steps of machine vision system? Explain any one.	(4)
	b)	Explain the construction and principle of CMM.	(4)
	c)	Mention the disadvantages of CMM.	(2)

PART C

Answer any four full questions, each carries 10 marks.

9	a)	With suitable example explain the elements of generalized measurement system.	(6)
	b)	Write short notes on accuracy and precision with examples.	(4)
10	a)	Explain first-order system with suitable examples.	(4)
	b)	Write short notes on signal conditioning stage.	(3)
	c)	State the dynamic characteristics of simplified measuring system.	(3)
11	a)	Describe with neat sketch working of LVDT.	(6)
	b)	Give the classifications of measuring instruments.	(4)
12	a)	With neat sketch explain the working principle of pneumatic load cell.	(4)
	b)	Write short notes on accelerometers.	(3)
	c)	What are the factors to be considered for bonded strain gauge?	(3)
13	a)	Explain with neat diagram how to measure the power by using rope brake dynamometer.	(5)
	b)	Explain the construction of a thermocouple.	(3)
	c)	What are the advantages of resistance temperature detectors (RTDs)?	(2)
14	a)	Briefly explain the calibration of temperature measuring devices.	(4)
	b)	Explain the working of pressure thermometer.	(4)
	c)	What is the principle of radiation pyrometer?	(2)

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