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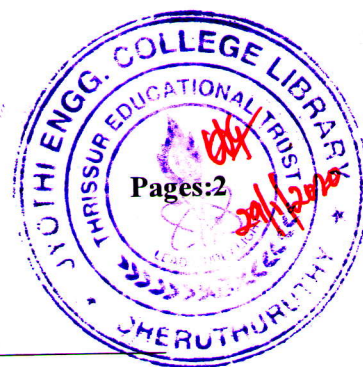
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019
Course Code: ME312
Course Name: METROLOGY AND INSTRUMENTATION

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any three full questions, each carries 10 marks.

Marks

1	a)	Why do we go for highly precise measuring instruments?	(3)
	b)	What is meant by calibration and precision of an instrument?	(3)
	c)	Differentiate between the line standards and the end standards.	(4)
2	a)	What is the advantage of using the wavelength standard?	(3)
	b)	What is meant by wringing of slip gauges?	(3)
	c)	Explain how Sine bar is used for measurement of small size component and large size component	(4)
3	a)	With a neat sketch explain Johansson Mikrokator.	(4)
	b)	Explain the working of a laser interferometer	(3)
	c)	What is meant by the hole basis system and the shaft basis system.	(3)
4	a)	Write the difference between inspection gauges and workshop gauges?	(3)
	b)	Differentiate between clearance fit and interference fit.	(3)
	c)	What is meant by work tolerance and gauge tolerance?	(4)

PART B
Answer any three full questions, each carries 10 marks.

5	a)	Explain the measurement of effective diameter of a screw thread with two wire method.	(3)
	b)	Explain the measurement of flank angle by profile projector.	(3)
	c)	What is the meaning of surface texture, roughness and waviness?	(4)
6	a)	What is Ra, Rt and Rz values in surface roughness?	(3)
	b)	With a neat sketch explain the working of a Talysurf.	(3)
	c)	With a neat sketch explain the working of an autocollimator.	(4)
7	a)	Explain the alignment testing of a drilling machine.	(3)
	b)	Explain the components and construction of a Co-ordinate Measuring Machine.	(4)

	c)	Explain any four applications of the Co-ordinate Measuring Machine.	(3)
8	a)	Differentiate between contact probes and non-contact probes.	(3)
	b)	Explain any three applications of a machine vision system.	(3)
	c)	Explain the steps in machine vision.	(4)

PART C
Answer any four full questions, each carries 10 marks.

9	a)	What is the significance of mechanical measurement?	(3)
	b)	Explain any four methods of measurement.	(4)
	c)	Explain the various stages in a generalized measuring system.	(3)
10	a)	Explain the terms repeatability and sensitivity.	(3)
	b)	Explain the static characteristics of a measuring instrument.	(4)
	c)	How will you quantify parallax error in measurement?	(3)
11	a)	Explain any three dynamic error of an instrument.	(3)
	b)	What is LVDT and mention the advantages of LVDT	(4)
	c)	Explain any three classifications of a transducer.	(3)
12	a)	Explain the working of an electrical resistance strain gauge.	(3)
	b)	How the three component force measurement is carried out by using a piezoelectric quartz crystal.	(4)
	c)	Explain the different types of strain gauges	(3)
13	a)	Explain the basic principle of hydraulic load cell.	(3)
	b)	How the torque measurement is carried out by a rope brake dynamometer.	(3)
	c)	Explain how vibration is measured by using an accelerometer.	(4)
14	a)	What is radiation pyrometer	(4)
	b)	List out any two advantages of thermocouple over thermometer.	(3)
	c)	What is a thermistor?	(3)

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