Q. Code: 775668

# **B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023**

#### Fifth Semester

**ME16504 – METROLOGY AND MEASUREMENTS** 

(Mechanical Engineering)

(Regulation 2016)

## **TIME: 3 HOURS**

MAX. MARKS: 100

# **PART-** A (10 x 2 = 20 Marks)

(Answer all Questions)

- 1. Differentiate the systematic and random errors.
- 2. Discuss the need for calibration of measuring instruments.
- 3. Explain the process of "Wringing" in slip gauges.
- 4. How the sprit level is used to check the machines?
- 5. Discuss the advantages of LASER Interferometry over light interferometry.
- 6. Write short notes on probes used in CMM.
- 7. Name the different methods used to check the screw thread.
- 8. How the gear tooth thickness is measured?
- 9. Discuss the principle of force measurement.
- **10.** How thermocouples differ from thermistors?

### **PART- B (5 x 16 = 80 Marks)**

#### Marks

11. (a)	(i)	Distinguish between accuracy and precision of measurement with suitable example.	(8)
	(ii)	Define systematic errors and explain the causes of those errors with examples.	(8)
		(OR)	
(b)	(i)	With neat sketch explain the generalized measurement system with suitable example.	(8)
	(ii)	Explain the working principle of dial gauge with neat diagram.	(8)
12. (a)	(i)	Write short notes on bevel protractor.	(4)
	(ii)	Describe the constructional details of autocollimator and explain how it is used to measure the surface flatness.	(12)

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(OR)

(b)	(i) (ii)	With neat diagram, explain the angle measurement using sine bar. Write short notes on alignment telescope.	(10) (6)
	(ii)	Explain the functionality of machine vision system with suitable application.	(8)
		(OR)	
(b)	Discu	iss the classification of CMM based on the construction. Describe the construction	(16)
	and o	peration of any one type of coordinate measuring machine with applications.	
14. (a)	(i)	Explain the procedure of measuring the effective diameter of the screw thread using floating carriage micrometer.	(10)
	(ii)	Explain the principle of measuring gear tooth thickness by base tangent method.	(6)
		(OR)	
(b)	(i)	With the help of neat sketch, explain the function of a parkinson gear rolling tester	(10)
	(ii)	Write short notes on best wire size.	(6)
15. (a)	(i)	With neat diagram, explain the working principle of eddy current dynamometer.	(8)
	(ii)	Explain the temperature measurement using radiation pyrometer.	(8)
		(OR)	
(b)	(i)	With neat diagram explain the working principle of bourdon tube pressure gauge.	(10)
	(ii)	Discuss the application of rotameter with necessary diagram.	(6)

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