Q. Code: 854531

Reg. No. | | | | | | | | | | | | | |

B.E. / B. TECH.DEGREE EXAMINATIONS, MAY 2024

Fifth Semester

ME16504 – METROLOGY AND MEASUREMENTS

(Mechanical Engineering)

(Regulation 2016)

TIME:3 HOURS **MAX. MARKS: 100**

PART- A(10x2=20Marks)

(Answer all Questions)

1. Distinguish between sensitivity and range.

2. Define: Interchangeability.

3. What is meant by least count?

4. What are the applications of Clinometer?

5. List out any two applications of interferometer.

6. Name any two straightness measuring instrument.

7. What is progressive error in screw threads?

8. Write the importance of straightness measurement.

9. Discuss the working principle of pyrometer.

10. Name any two method employed for force measurement.

PART- B (5x 16=80Marks)

			Marks
11. (a)	**(i)**	Discuss the various methods of measurements.	**(12)**
	(ii)	Discuss the Taylor's Principle of gauge design with suitable diagram.	**(4)**
		(OR)	
(b)	**(i)**	Compare the mechanical comparator with optical comparators.	**(6)**
	(ii)	Define error and explain the causes of those errors with suitable example.	**(10)**
12. (a)	**(i)**	Discuss the working principle of micrometer and deduce its least count.	**(6)**
	(ii)	Explain about the autocollimator with neat sketch and discuss its applications.	**(10)**
		(OR)	
(b)	**(i)**	Why the sine bars are inaccurate as the angle exceeds 45°?	**(12)**
	(ii)	Discuss the sources of errors in sine bar.	**(4)**
13. (a)	**(i)**	Explain the construction and working principle of ACLI.	**(10)**

	(ii)	Compare: conventional metrology and coordinate metrology.	**(6)**
		(OR)	
(b)	**(i)**	Describe industrial applications of CMM with example.	**(10)**
	(ii)	Explain the machine vision system with suitable example.	**(6)**
14. (a)	**(i)**	Explain the measurements of effective diameter of a screw thread using 3 wire method.	**(10)**
	(ii)	Discuss a method to find out the flatness of a surface plate.	**(6)**
		(OR)	
(b)	**(i)**	Drive the expression for tooth thickness of a gear in the constant chord method.	**(12)**
	(ii)	What are the factors affecting surface roughness of a machined components?	**(4)**
15. (a)	**(i)**	Discuss the principle, construction and working of rotameter with neat sketch.	**(10)**
	(ii)	Briefly explain the method of measuring Torque.	**(6)**
		(OR)	
(b)	**(i)**	Suggest suitable method for measuring the temperature on surface of the filament and also explain the procedure of measurement with neat sketch.	**(10)**
	(ii)	Briefly explain the method of measuring Power.	**(6)**

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