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**Question Paper Code : 50874**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017  
Fourth/Fifth Semester  
Mechanical Engineering  
ME 6504 – METROLOGY AND MEASUREMENTS  
(Regulations 2013)  
(Common to Materials Science and Engineering/ Mechatronics Engineering)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is the difference between correction and correction factor ?
2. Define Parasitic and illegitimate error.
3. What is the use of Feeler gauges ?
4. A vernier scale consists of 25 divisions on 12 mm spacing and the main scale has 24 divisions on 12 mm. What is the least count ?
5. On what factor the accuracy of laser interferometer mainly depends ?
6. List any three field applications of machine vision system.
7. How is surface roughness assessed ?
8. List out the sources of Out-of-Roundness.
9. Write the working principle of hot wire Anemometer.
10. What is the working principle of thermocouple ?

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PART – B

(5×13=65 Marks)

11. a) Classify standard methods of measurements in detail. (13)

(OR)

- b) What are the various possible sources of error in measurements ? Explain in detail. (13)

12. a) i) How slip gauges are manufactured ? (5)

- ii) Explain the construction and working principle of angle dekkor with a neat diagram. (8)

(OR)

- b) Explain with a neat sketches, the principle and working of an autocollimators and also list its applications. (13)

13. a) Explain different types of CMM, in detail. (13)

(OR)

- b) Explain the working principle of a AC laser interferometer with a neat diagram. (13)

14. a) Explain how a gear can be checked using Parkinson Gear Tester also mentions its limitations. (13)

(OR)

- b) With a neat sketch explain the working principle of Tomlinson Surface finish tester. (13)

15. a) Explain the construction and working principle of any two instruments used for measuring temperature. (13)

(OR)

- b) Explain the construction and working of Venturimeter and Rotameter. (13)

PART – C

(1×15=15 Marks)

16. a) A machine vision system recovers useful information about a scene from its two dimensional digitized image. What are the stages in machine vision process ?

(OR)

- b) Design a workshop type progressive type Go-Not-Go plug gauge suitable for 25 H7, with following information :

i) 25 mm lies in the diameter step of 18-30 mm.

ii)  $i = 0.45 \sqrt[3]{D + 0.001D}$

iii)  $IT7 = 16i$ .