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

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 ?

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.