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Total No. of Pages : 02

Total No. of Questions : 16

**B.Tech. (Ind. Engg. & Mgt. (TQM)) (Sem.-3)**  
**MEASUREMENTS & METROLOGY**  
Subject Code : IEM-303  
M.Code : 61013

Time : 3 Hrs.

Max. Marks : 40

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt All EIGHT Questions from SECTION-A carrying TWO marks each.
2. Attempt any SIX questions out of EIGHT from SECTION-B carrying FOUR marks each.

**SECTION-A**

- 1) Explain the basic concepts of measuring instruments and metrology.
- 2) Explain the advantages of Master and limit gauges as Dimensional measuring instruments.
- 3) Explain the function of Bevel protractors and Sine bar as Geometrical measurements.
- 4) Explain in brief various types of equipments used for Hardness testing of metals.
- 5) Explain in brief direct and indirect methods for measurement of liquid levels.
- 6) Explain the importance of sensors as a measuring instruments using suitable example.
- 7) Explain the differences between clearance fit and interference fit.
- 8) What do you mean by management and calibration of measuring instruments?

**SECTION-B**

- 9) Discuss in detail basic elements of a measurement systems.
- 10) What are Comparators, explain its types and advantages?

- 11) Explain the main components of coordinating measuring machine and discuss its special features.
- 12) Explain the basic principle and advantages of Microscope as testing and measurement instrument.
- 13) Discuss the basic concept of Dynamometer as a measurement of mechanical power and explain how measurement of torque is done?
- 14) Write a short note on Global Positioning System (GPS) as an electrical and electronic measuring instrument.
- 15) Explain the basic ISO system of fits and tolerances for hole based system and shaft based systems.
- 16) Explain the basic preventive and breakdown procedures used for monitoring and servicing of instruments.

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**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**