**Reg. No:**

### SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
#### (AUTONOMOUS)
**B.Tech III Year II Semester Regular Examinations July-2021**
**METROLOGY & MEASUREMENTS**
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

#### PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

| | | | | |
|---|---|---|---|---|
| **1** | **a** | Define limits and tolerances. | L1 | 2M |
| | **b** | Mention the features of a Universal Bevel Protractor. | L2 | 2M |
| | **c** | Name the various types of errors in gears. | L2 | 2M |
| | **d** | What is a piezoelectric sensor? | L1 | 2M |
| | **e** | Define seebeck effect and peltier effect. | L1 | 2M |

#### PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

#### UNIT-I

| | | | | |
|---|---|---|---|---|
| **2** | **a** | Define Maximum, Minimum Metal limits and Maximum, Minimum clearances with the help of neat sketches. | L1 | 5M |
| | **b** | Distinguish unilateral and bilateral tolerance system. | L4 | 5M |

**OR**

| | | | | |
|---|---|---|---|---|
| **3** | | Describe briefly the principal features of the Indian standard System of limits and fits. | L1 | 10M |

#### UNIT-II

| | | | | |
|---|---|---|---|---|
| **4** | **a** | What is mean by wringing process? Describe briefly grades of slip gauges. | L1 | 5M |
| | **b** | What is procedure for buildup slip gauge blocks for required dimension. | L1 | 5M |

**OR**

| | | | | |
|---|---|---|---|---|
| **5** | | Express the following methods of qualifying surface roughness: <br> i) Ra value.      ii) RMS value.      iii) Rz value. | L2 | 10M |

#### UNIT-III

| | | | | |
|---|---|---|---|---|
| **6** | **a** | Evaluate i) Outer diameter ii) Effective diameter. iii) Core diameter      iv) Pitch diameter | L5 | 5M |
| | **b** | Describe measurement of effective diameter with two-wire method with neat sketch. | L1 | 5M |

**OR**

| | | | | |
|---|---|---|---|---|
| **7** | **a** | Explain with neat sketch the gear tooth profile measurement. | L2 | 5M |
| | **b** | Describe the parkinson's gear tester and state its limitations. | L1 | 5M |

#### UNIT-IV

| | | | | |
|---|---|---|---|---|
| **8** | | Classify digital transducers. Elaborate piezoelectric effect and sketch with neat Piezo-electric transducer. | L6 | 10M |

**OR**

| | | | | |
|---|---|---|---|---|
| **9** | **a** | Classify measurement of angular speed tachometers and list out tachometers. | L2 | 5M |
| | **b** | Explain working of Photo-electric tachometer. | L2 | 5M |

#### UNIT-V

| | | | | |
|---|---|---|---|---|
| **10** | **a** | Define pyrometer. With neat sketch, elaborate total radiation pyrometer. | L1 | 5M |
| | **b** | What is formula for dead weight tester? Discuss the Dead Weight gauge in detail. | L1 | 5M |

**OR**

| | | | | |
|---|---|---|---|---|
| **11** | | Sketch a Mcleod gauge and explain working principles. Describe applications and limitations. | L1 | 10M |

***END***