



ROLL NO:

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 20 %

Max Marks: 40

Max Time: 1 hr.

Monday, 24th September, 2018

TEST – 1

Odd Semester 2018-19

Course: **MEC 211 Metrology & Mechanical Measurements.**

V Sem. Mechanical

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

(3 Q x 4 M = 12 Marks)

1. A selection of slip gauges is required to build a height of 58.155 mm using two protection gauges of 1.5 mm thickness. Select the best combination of gauges using 112 set.
2. Define the following
 - a). Sensitivity
 - b). Calibration
 - c). Magnification
 - d). Resolution
3. Distinguish between unilateral and bilateral tolerances with a neat sketch.

Part B

(3 Q x 6 M = 18 Marks)

4. Discuss the different reasons for the occurrence of systematic/controllable errors.
5. Explain International Prototype Meter with a neat sketch.
6. Explain Primary, Secondary and Working Standards.

Part C

(1Q x 10 M = 10 Marks)

7. Describe the procedure to transfer from Line standard to End Standard.



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TEST 2

Odd Semester: 2018-19

Course Code: MEC 211

Course Name: Metrology and Mechanical Measurements

Branch & Sem: MEC & V Sem

Date: 27 November 2018

Time: 1 Hour

Max Marks: 40.

Weightage: 20%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **four** marks.

(3x4=12)

1. Differentiate Hole basis system and Shaft basis system.
2. What is maximum material limit? Explain w.r.t. hole and shaft.
3. Derive an expression for Best size wire to measure effective diameter of screw thread.

Part B

Answer **all** the Questions. **Each** question carries **eight** marks.

(2x8=16)

4. With neat diagram explain Gear tooth terminology (at least five important parameters).
5. Derive an expression for Three wire method to determine effective diameter of screw thread.

Part C

Answer the Question. Question carries **twelve** marks.

(1x12=12)

6. Determine the actual dimensions to be provided for a shaft and hole 90 mm size for **H8e9** type clearance fit. Size 90 mm falls in the diameter step of 80 - 100 mm. Value of standard tolerance unit $i=0.45\sqrt[3]{D}+0.001D$. The values of tolerances for IT8 & IT9 grades are 25i & 40i respectively. Value of fundamental deviation for 'e' type shaft is $-11D^{0.41}$. Also design the GO & NO GO gauges considering wear allowance as 10% of gauge tolerance.



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**PRESIDENCY UNIVERSITY
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END TERM FINAL EXAMINATION

Odd Semester: 2018-19

Course Code: MEC 211

Course Name: Metrology and Mechanical Measurements

Programme & Sem: MECH & V Sem

Date: 28 December 2018

Time: 2 Hours

Max Marks: 80

Weightage: 40%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **five** marks.

(4Qx5M=20)

1. Define measurement. Mention types of measurement.
2. What is a Transducer? Explain passive transducer.
3. Write note on Thermistors.
4. Explain the procedure for bonding of strain gauges.

Part B

Answer **all** the Questions. **Each** question carries **eight** marks.

(5Qx8M=40)

5. Sketch and explain Generalized measurement system with suitable example.
6. With neat diagram explain Equal arm balance. Derive an equation for sensitivity for the same.
7. Explain Hydraulic dynamometer with neat diagram. List any four advantages of the same.
8. With neat sketch explain working of proving ring.
9. With neat sketch explain any one device/instrument to measure flow rate.

Part C

Answer **both** the Questions. **Each** question carries **ten** marks.

(2Qx10M=20)

10. With neat diagram explain optical pyrometer.
11. Explain McLeod Gauge (derivation of expression for pressure should be included)

