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BIMEE-015

**B.Tech.-VIEP-MECHANICAL ENGINEERING
(BTMEVI)**

Term-End Examination, 2019

**BIMEE-015 : INDUSTRIAL MEASUREMENT
AND QUALITY CONTROL**

Time : 3 Hours]

[Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Explain the temperature compensation of a strain gauge. [7]
- (b) Explain briefly various stages of the general measurement system. [7]
2. (a) What is the difference between precision and accuracy ? Explain the main characteristics of the instruments. [7]
- (b) Describe the working of mechanical and electrical tachometers. [7]

3. (a) A single strain gauge having a resistance of $100\ \Omega$ and a gauge factor of 20 is mounted on a steel cantilever beam and connected in series with $100\ \Omega$ ballast resistor and a 12 volt battery. The bending stress at the gauge fluctuates from 0 to $19.62 \times 10^8\ \text{N/m}^2$, compute the corresponding variation in output voltage, can this variation be magnified to full scale on an oscilloscope ? The oscilloscope has sensitivity of 10mv/ cm of trace deflation and a screen length of 10 cm. [10]
- (b) Differentiate between Random and Systematic errors. [4]
4. (a) Name various types of instruments used for speed measurement. Explain working of magnetic tachometer. [7]
- (b) Explain any one method for non-contact type temperature measurement. [7]
5. (a) Name different techniques available for elemental analysis. Explain any one of them in detail. [7]

- (b) What are methods used for level measurement ? What is the difference between direct and Indirect method of level measurement ? Explain with suitable examples. [7]
6. (a) Explain working principles of conductivity methods used for measurement. [7]
- (b) Name the various methods for vibration amplification. Explain any one of them in detail. [7]
7. (a) How do you measure the stress by photoelastic method ? Explain with suitable illustrations. [7]
- (b) Describe Gyroscopic devices used in the measurement of angular motion. [7]
8. Write short notes on **any four** of the following : [4×3.5=14]
- (a) Generalized data acquisition systems
- (b) Instaurations of strain gauges
- (c) Electropneumatic actuators

- (d) Thermo couples
- (e) Solid level Indicator
- (f) Pyrometer

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