YMCA UNIVESITY OF SCIENCE AND TECHNOLOGY, FARIDABAD

B.TECH 5TH SEM EXAMINATION (Under CBS), DEC 2016

(32)

Measurement and Metrology (MU 307)

Time: 3hrs **M.Marks:60**

Note: 1. Part-I is compulsory and in Part-II attempt any four questions out of six. Assume any suitable data any if missing.

Part –I

Q1 Answer all the question in 20-40 words.

a) What is the difference between repeatability and reproducibility?
b) Define the limiting (guarantee) errors.
c) A strain gauge with a gauge factor 4 has a resistance of 500 Ω. It is to be used in a test in which in which the strain to be measured as low as 5×10^{-6}. What will the change in resistance of gauge be?
d) What is the principle of Knudsen gauge?
e) What is the function of strain rosettes?
f) Why correction is applied in Liquid in glass thermometers?
g) What do you mean by obstruction meter in flow measurement?
h) What do mean by vibration pickups?
i) Define the tolerance.
j) Define the flatness? (10×2=20)

Part-II

Q2. What is drift? Explain the different types of drifts with sketches of input-output relation in each case. (5)

b) How are errors classified? Explain the systematic error. (5)

Q3.a) What is the difference between piezo-resistive and piezoelectric transducer? Explain the working and application Hall effect sensor. (5)

b) Describe the construction, working and application of McLeod gauge. (5)

Q4. a) A strain gauge having a resistance of 100Ω and gauge factor of 2.0 is mounted on a steel bar. It forms one arm of a symmetrical Wheatstone bridge circuit. When a tensile load is applied on the bar, the galvanometer shows the output voltage equivalent to 4.5 mV. if the operating current is 12 mA, calculate the mechanical strain developed in the bar. (5)

b) Explain the bimetallic thermometer. What are commonly used materials. What are their advantage and disadvantage. (5)

Q5.a) What are the causes of vibration? Discuss the methods used for vibration measurement. (5)

b) Describe the working of magnetic flow meter. What are the advantages and disadvantages of magnetic flow meter? (5)

Q6.what is the principle of autocollimator. Give the application of autocollimator. (5)

b) Define the surface texture. Explain how surface roughness tester is used for the measurement of surface finish. (5)

Q7. Write short note on following

(a) CMM
(b) limit gauge
(c) Sampling plans

(4+3+3=10)