

IN 304 - Sensors and Transducers-I

P. Pages : 1

Time : Three Hours

**GUG/W/16/3783**

Max. Marks : 80

- Notes :
1. All questions carry equal marks as indicated.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Illustrate your answers wherever necessary with the help of neat sketches.
 4. Same answer book must be used for each section.

1. a) Explain static and dynamic characteristics in detail. 8
 b) List typical criteria for selection of displacement sensor. 8

OR
2. a) Discuss different types of error in measurement. 8
 b) Define the following. 8
 i) Mean ii) Standard deviation
 iii) Average deviation iv) Variance
3. a) Derive a mathematical expression of a gauge factor. 8
 b) A hydraulic testing machine is to apply a maximum force of 300 KN/m² and the ram diameter is 130 mm. If the force is to be indicated on a pressure gauge having a scale over an arc of 270° calculate the required range and sensitivity is the pressure gauge. 8

OR
4. a) Write a short note on absorption type dynamometer. 8
 b) Discuss force measurement in short. 8
5. a) Describe LVDT in detail. 8
 b) How thickness can be measured with the help of ultrasonic transducer. 8

OR
6. a) Draw and explain working is differential capacitive cell. 8
 b) Explain Hall effect transducers in detail. 8
7. a) A variable reluctance type tachometer has 60 rotor teeth. The counter records 3600 counts per second. Determine the speed in rpm. 8
 b) Explain measurement of speed of shafts. 8

OR
8. a) While measuring speed of a stream turbine with stroboscope single line images were observed for stroboscope setting of 3000, 4000 and 5250 r.p.m. Calculate the speed of turbine. 8
 b) Explain in brief potentiometric type accelerometer. 8
9. a) Describe in detail working of conductivity measurement. 8
 b) How p^H is measured? List different types of p^H electrodes. 8

OR
10. a) Explain measurement of Viscosity in short. 8
 b) Describe smoke detector in brief. 8
