

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: AE204**

**Course Name: SENSORS AND TRANSDUCERS (AE)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions. Each question carries 15 marks*

- 1 a) Define a Transducer. Explain the classification of transducer based on transduction principle. 8
- b) Explain the principle of operation of LVDT with suitable diagrams. 7
- 2 a) Explain electrical resistance strain gauge. Derive the equation for gauge factor. 8
- b) Distinguish between Active and Passive transducer with examples. 4
- c) What is the necessity of a secondary transducer? Illustrate with example. 3
- 3 a) Explain the basic principle of operation of resistance transducers? With an example explain loading in resistance transducers? 8
- b) Draw and explain capacitive level transducer. Explain how the measurement can be made using differential bridge arrangement. 7

**PART B**

*Answer any two full questions. Each question carries 15 marks*

- 4 a) With suitable diagrams explain the operation of Gyroscope. 8
- b) Explain the use of proving ring type load cell for the measurement of force. 4
- c) Describe the working of hydraulic load cell. 3
- 5 a) Explain any two type of manometer for the measurement of pressure. 8
- b) Explain the technique to find out shaft power with example. 7
- 6 a) Explain the use of dead weight calibrator for the calibration of pressure gauges. 7
- b) Describe the working of a capacitive microphone with neat diagram. 5
- c) Comment on the nature of filters used with sound level meters. 3

**PART C**

*Answer any two full questions. Each question carries 20 marks*

- 7 a) Explain the principle of operation of Hall effect transducers. Enumerate their applications. 8
- b) Derive the transfer function for mass damper arrangement. 4

- c) Explain the principle of operation of 8  
i) Semi-conductor sensor      ii) Piezo electric sensor
- 8 a) Explain stroboscopic principle for the measurement of angular speed. 5  
b) Explain the working of hot wire anemometers with schematics. 10  
c) Describe any one method to detect the proximity of an object. 5
- 9 a) Explain any two constant area variable pressure drop type devices for the 10  
measurement of flow.
- b) Explain the principle of operation of 10  
i) Rotameter      ii) Impeller type flow meter