

Reg No.: _____

Name: _____

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

Course Code: AE204

Course Name: SENSORS AND TRANSDUCERS (AE)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

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| 1 | a) Differentiate a sensor from Transducer? Explain the classification of transducer based on physical and chemical transduction principle? | (8) |
| | b) Explain the classification of different types of electrical resistance strain gauges? | (7) |
| 2 | a) Explain the transducers used for measuring the following quantities
i) Humidity ii) Water level | (8) |
| | b) What is the significance of gauge factor? Derive the expression for electrical resistance strain gauge? | (7) |
| 3 | a) How displacement can be measured using a potentiometer? Explain the loading and nonlinearity effects associated with measurement? | (9) |
| | b) Distinguish Active and Passive transducer with examples? | (6) |

PART B

Answer any two full questions, each carries 15 marks.

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| 4 | a) How attitude of an air-borne vehicle can be measured? | (8) |
| | b) Explain the use of pillar type load cell for the measurement of force? | (4) |
| | c) Describe the working of pneumatic load cell? | (3) |
| 5 | a) Explain the principle of operation of the following transducers?
i) Well type manometer ii) U tube manometer | (8) |
| | b) Explain the method for calibrating a pressure gauge? | (7) |
| 6 | a) Explain sound level meters with neat diagram. | (7) |
| | b) Explain how sound can be transduced in to an electrical quantity? | (5) |
| | c) Describe cradling method for torque measurement? | (3) |

PART C

Answer any two full questions, each carries 20 marks.

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| 7 | a) Explain the principle of operation of semiconductor sensors? Enumerate their applications? | (8) |
| | b) State and Explain Bernoulli's principle? | (4) |
| | c) Explain the principle of operation of electromagnetic flow meter.
i) Magnetostrictive transducer ii) Fiber optic sensor | (8) |
| 8 | a) Explain how mass damper system could be used for the measurement of Acceleration. | (5) |
| | b) Explain how flow can be measured using hot wire anemometers? | (10) |
| | c) Describe the working of Eddy current Transducers? | (5) |
| 9 | a) Explain the use of rotameter for the measurement of flow? | (7) |
| | b) Explain the principle of operation of electromagnetic flow meter. | (8) |
| | c) Explain the working of tachogenerators? | (5) |
