signal.

## CULLDAT TECHNOLOCICAL UNIVEDSITY

| GUJARAT TECHNOLOGICAL UNIVERSITT<br>ME SEMESTER-1 • EXAMINATION – SUMMER 2016 |                      |  |    |
|---|----------------------|--|----|
| S<br>S<br>T   | ubje<br>ubje<br>'ime | ect Code: 2724114 Date: 27/05/2016<br>ect Name: Sensor Signal Processing<br>•10•30 am to 1•00 nm Total Marks: 7(                                     | 1  |
| In  | nstru                | ctions:  | J  |
|   |                      | <ol> <li>Attempt all questions.</li> <li>Make suitable assumptions wherever necessary.</li> <li>Figures to the right indicate full marks.</li> </ol> |    |
| Q.1   | (a)                  | Explain following terms with reference to sensing and instrumentation.<br>(i) Accuracy (ii) Precision (iii) sensitivity                              | 07 |
|   | (b)                  | What is sensor with reference to instrumentation? Classify sensors in view of their applications.  | 07 |
| Q.2   | (a)                  | List out various temperature sensors and explain working of any one.   | 07 |
|   | (b)                  | List the applications of potentiometer sensor in/around your home and in industries.   | 07 |
|   |                      | OR CONTRACTOR CONTRACTOR CONTRACTOR  |    |
|   | (b)                  | Draw schematic diagram of inductive proximity switch and explain working of it.  | 07 |
| Q.3   | (a)                  | What is the role of sensor signal conditioning circuit ? why OP-AMP is suitable for analog signal conditioning.                                      | 07 |
|   | (b)                  | Draw and explain complete circuit to amplify and linearize bridge output.<br><b>OR</b>   | 07 |
| Q.3   | (a)                  | Explain OP-AMP noise model and explain how noise can affect sensing.   | 07 |
|   | (b)                  | Write short note on instrumentation amplifier.   | 07 |
| Q.4   | (a)                  | Draw and explain working of schmitt trigger circuit.   | 07 |
|   | (b)                  | Compare normal amplifier with Low Noise amplifier.   | 07 |
| Q.4   | (a)                  | Draw and explain working of zero crossing detector circuit. Discuss one application of this circuit  | 07 |
|   | (b)                  | What is the role of filters in instrumentation schemes? explain working of any one active filter for particular sensing application.                 | 07 |
| Q.5   | (a)                  | What is mixed mode controller ? state major advantages and disadvantages of it.  | 07 |
|   | (b)                  | Why do we need pulse width modulated signal to control speed of motor ? Draw and explain circuit to generate PWM signal.                             | 07 |
| 0.5   | (a)                  | Draw and explain architecture of any one mixed mode controller   | 07 |
|   | (b)                  | Draw and explain OP-AMP based circuit to convert digital signal into the analog  | 07 |

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