Total No. of Pages 02   —241—   Roll. No......................

V SEMESTER   B.Tech EVENING (CEE)

SUPPLEMENTARY EXAMINATION   FEB-2019

CEE-355 : Instrumentation

Time: 3:00 Hours   Max. Marks: 50

> **Note :** Attempt total 10 questions.
> Question no 1 to 5 are compulsory.
> Assume suitable missing data, if any.

Q.1 In an R-2R ladder network DAC is required to give an output voltage in the range of 0 to 10 V, corresponding to 10-bit digital input signal 00000000 to 11111111. Assuming Vref = -10 V and R=2K ohm, calculate the value of Rf and find the output voltage corresponding to an input signal of 11000101?   [5]

Q.2 A 5 bit converter used for a Dc voltage range of 0-10V. Find the weight of MSB and LSB also exact range of converter and error. Find the error if a 10 bit converter is used?   [5]

Q.3 A control valve has a linear variation of opening as the input voltage from 0 to 10 V. A microcomputer outputs an 8 bit output word to control valve opening using an 8 bit D/A converter to generate the valve voltage.
(a) Find the reference voltage required to obtain full valve opening (10 V).
(b) Find the percentage of valve opening for all bit change in the input word.   [5]

Q.4 A variable dielectric capacitive displacement sensor consists of two square metal plates, side 5cm, separated by a gap of 1mm. A sheet of dielectric material 1mm thick and same area as the plates can be slid between them as shown in fig.1. Given that the dielectric constant of air is 1 and that of dielectric material is 4, calculate the capacitance of the sensor when the input displacement x=0.0 , 2.5 , 5.0 cm.   [5]
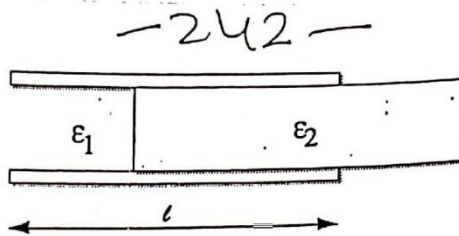
P. T.O

ε_1 ε_2

ℓ

Fig. 1

Q.5 In successive approximation ADC, the maximum value of input signal can be 2.55 V and minimum 0 V for 8 bit ADC. Calculate digital output for input signal $y_i = 0.515$ V with explanation? [5]

Q.6 What is Telemetry and explain about Frequency Modulation with the help of diagram? [5]

Q.7 Explain in detail about working of LED displays with the help of circuit? [5]

Q.8 Write a short note on Virtual Instrumentation? [5]

Q.9 Explain in detail working of Digital Storage Oscilloscope (DSO)? [5]

Q.10 Write short note on counter ramp ADC? [5]

Q.11 Explain in detail about the operations involved in Analog to Digital data conversion. Discuss the importance of sample and hold circuit? [5]

Q.12 List different methods of liquid level measurement and explain any one in detail. [5]

Q.13 Explain what is Data Acquisition system with the help of block diagram. [5]

Q.14 Write short note on any two: [5]
   (a) Photo emissive light sensors
   (b) Landline and RF Telemetry
   (c) LVDT and RVDT