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V SEMESTER

B.Tech (UEE)

SUPPLEMENTARY EXAMINATION

FEB-2019

EE/EL-355: Instrumentation

Time: 3:00 Hours

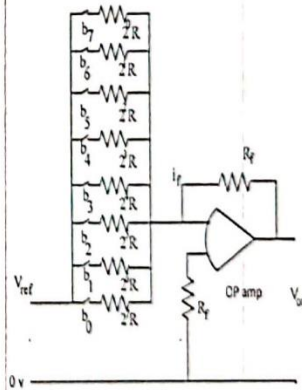
Max. Marks : 50

Note : Attempt total 10 questions.

Question no 1 to 5 are compulsory.

Assume suitable missing data, if any.

- Q.1 The digital to analog converter as shown in the figure below is required to give an output voltage in the range of 0 to 5 V, corresponding to 8-bit digital input signal 00000000 to 11111111. Assuming  $V_{ref} = -15$  V and  $R = 10$  K ohm, calculate the value of  $R_f$  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 In an R-2R ladder network DAC is required to give an output voltage in the range of 0 to 5 V, corresponding to 5-bit digital input signal 00000 to 11111. Assuming  $V_{ref} = -20$  V and  $R = 2.5$  K ohm, calculate the value of  $R_f$  and find the output voltage corresponding to an input signal of 10101? [5]

Q.4 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.5 (a) A Hall effect transducer is used for the measurement of a magnetic field of  $0.5$  Wb/m<sup>2</sup>. The 2 mm thick slab is made of Bismuth for which the Hall's coefficient is  $-1 \times 10^{-6}$  Vm/(A-Wb m<sup>-2</sup>) and the current is 3A. find the Hall voltage generated?

(b) An LVDT with a secondary voltage of 5 V has a range of -25 to +25 mm. find the output voltage when the core is at -18.75 mm from the centre. Also plot the output voltage versus core position for a movement going from +18.75 mm to -10 mm? [5]

Q.6 Explain in detail about working of LED displays with the help of circuit? [5]

Q.7 Explain in detail about Hall Effect sensor with the help of diagram? [5]

Q.8 An analogue to digital converter has an input range of 0 to 5 V and incorporates a 12 bit encoder. Assuming a binary encoder, find the maximum quantisation error and also find the digital output signals corresponding to input voltages of 0.55 V and 2.63 V? [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 different components of Data Acquisition System with the help of block diagrams? [5]

Q.12 Explain working of Pirani gauge for measurement of pressure? [5]

Q.13 Explain how Load cell and Cantilever beam are used for force measurement? [5]

Q.14 Write short note on Any two : [5]  
(a) IEEE 1451 standard  
(b) Landline and RF Telemetry  
(c) Virtual Instrumentation

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