Q.P. Code : 24936

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question.No.1 is compulsory.
2. Attempt any 3 Questions from remaining 5 Questions.
3. Assume suitable data whenever necessary.

Q.1 Answer any 04 out of the 05 questions given below: **20**

a) Explain the working of Zero crossing detector with diagram.
b) Explain in brief, the concept of loading and method of reducing it.
c) Explain in brief, data acquisition system.
d) Draw and explain sample and hold circuit.
e) Explain the characteristics of digital data.

Q.2 a) Draw and explain 3 op-amp instrumentation amplifier, giving its applications. Explain any one application in detail. **10**

b) Explain with circuit diagram, the working of ideal integrator. Give the problems associated with it and show how it is overcome in practical integrator. **10**

Q.3 a) Give the advantages of precision rectifier over traditional diode rectifier. Explain with a circuit diagram the working of absolute value circuit using op-amp. **10**

b) Give the advantages of active filters over passive filters. Design a second order low pass Butterworth filter with a high cut-off frequency of 3 KHz. **10**

Q.4 a) Draw and explain, principle and working of RTD. What is the signal conditioning associated with it. **10**

b) Using an RTD with α = 0.0034 / ^{0}C and R = 100 Ω at 20^{0}C, design a bridge and op-amp circuit to provide 0 V to 10.0 V output for 20^{0}C to 100^{0}C. The RTD has P_D = 28 mW/^{0}C and maximum ΔT=0.05^{0}C **10**

Q.5 a) Design and explain the operation of Astable multivibrator using IC555. **10**

b) Draw and explain the signal conditioning circuit used in strain gauges. **10**

Q.6 Write short notes on (any four): **20**

a) Phase locked loops
b) SMPS
c) V to F Converter
d) Flash type ADC
e) All pass filter

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