**NJR/KS/18/3123**

### Bachelor of Science (B.Sc.) Semester–IV (CBS) Examination

### ELECTRONICS

### (Analogue & Digital Techniques)

### Paper–I

Time : Three Hours]                                                                                      [Maximum Marks : 50

**N.B. :—** (1)   **All** questions are compulsory and carry equal marks.

(2)   Draw diagrams wherever necessary.

1. **EITHER**

   (a)   What is feedback ? Explain the positive and negative feedback. Explain the concept of feedback amplifier.

   In a negative feedback amplifier open loop gain is 100, $\beta = 0.04$ and input voltage $V_i = 50$ mV, calculate,

   (i)   Gain with feedback ($A_f$)

   (ii)   Output voltage ($V_o$).                                                                                  7+3

   **OR**

   (b)   What is oscillator ? Give the classifications of oscillators.

   Explain the construction and working of colpitt's oscillator.                              1+3+6

2. **EITHER**

   (a)   With neat circuit diagram explain the construction and working of symmetric astable multivibrator using OP-AMP. Derive the expression for frequency of output of astable multivibrator.      6+4

   **OR**

   (b)   What is Sample and Hold circuit ? Explain the working of S/H circuit using OP-AMP.

   Explain the construction and working of instrumentation amplifier.                       5+5

3. **EITHER**

   (a)   What is DAC ? Explain need of DAC with neat circuit diagram, the construction and working of binary weighted 4-bit DAC.

   State its limitations.                                                                                1+2+5+2

   **OR**

   (b)   Define the following Parameters of DAC :

   (i)   Resolution

   (ii)   Accuracy

   (iii)   Linearity.

   Describe the construction and working or R-2R ladder type DAC.

   State its advantages.                                                                                      3+5+2

4. **EITHER**

(a) What is ADC ? Explain the construction and working of dual slope A/D converter state its advantages and disadvantages. 1+6+3

**OR**

(b) Describe the construction and working of counter type A/D converter.

State its advantages and disadvantages. 7+3

5. Attempt any **ten** :

(a) State any two differences between oscillator and amplifier.

(b) What are the advantages of negative feedback ?

(c) What is tank circuit ?

(d) State the types of feedback used in multi vibrator circuit.

(e) What are the sources of errors in S/H circuit (any two) ?

(f) Five the main advantages of instrumentation amplifier.

(g) State the applications of DAC

(h) Write the purpose of OP-AMP used in weighted resister DAC

(i) What is binary ladder ?

(j) State the Shannon Nyquist sampling theorem.

(k) Give the advantages of Flash type ADC

(l) Define sampling rate of ADC. 1×10