

Bachelor of Science (B.Sc.) Semester—IV Examination
ELECTRONICS (Analogue and Digital Techniques)
Optional Paper—I

Time : Three Hours]

[Maximum Marks : 50

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

(2) Draw neat and well labelled diagram wherever necessary.

EITHER

1. (A) Explain the basic oscillatory action. With the neat diagram explain the working of Colpitt's oscillator. 4+6

OR

- (B) Explain the working of phase shift oscillator with circuit diagram. In a phase shift oscillator, the three RC sections are made up of $R = 1 \text{ k}\Omega$ and $C = 0.1 \text{ }\mu\text{f}$. Calculate the frequency of oscillation at the output. 6+4

EITHER

2. (A) Draw circuit diagram of instrumentation amplifier and explain its working. Draw circuit diagram of astable multivibrator using OP-AMP and explain its working. 5+5

OR

- (B) Explain the need of sample and hold circuit. With the help of circuit diagram explain the working of Sample and Hold circuit using OP-AMP. Draw necessary input and output waveforms. 2+5+3

EITHER

3. (A) Explain the following terms with respect to D/A converter :

- (i) Range
- (ii) Resolution
- (iii) Linearity
- (iv) Speed.

Explain the working of R-2R type D/A converter with the help of neat diagram. 4+6

OR

- (B) Explain the need of D/A converter. With the help of neat diagram explain weighted resistor type D/A converter. State the advantages and disadvantages of weighted resistor type D/A converter. 2+6+2

EITHER

4. (A) Draw the block diagram of Dual Slope A/D converter and explain its working. State the advantages of dual slope ADC. 7+3

OR

- (B) Explain with suitable diagram, the working of counter type ADC. State its advantages and disadvantages. 7+3

5. Answer any **TEN** :

- (a) State the difference between AF and RF Oscillator.
- (b) State the formula for frequency of oscillation in Wein bridge oscillator.
- (c) What is multivibrator ?
- (d) Define monostable multivibrator.
- (e) What is need of D/A converter ?
- (f) State the advantages of R-2R ladder type D/A converter.
- (g) What is meant by ADC stability ?
- (h) State sampling theorem.
- (i) What is oscillator ?
- (j) State the uses of instrumentation amplifier.
- (k) State true or false : “DAC is an essential part of ADC”.
- (l) State the drawback of single slope A/D converter.

1×10=10