

NTK/KW/15-5871

Fourth Semester B. Sc. Examination

ELECTRONICS

Paper – I

(Analogue and Digital Techniques)

Time : Three Hours]

[Max. Marks : 50

N. B. : (1) All questions are compulsory and carry equal marks.
(2) Draw well labelled diagrams wherever necessary.

EITHER

1. (A) What is an oscillator ? Explain Barkhausen criterion for oscillations. Draw a circuit diagram and explain the working of crystal oscillator. State its advantages.

1 + 3 + 4 + 2

OR

(B) What is feedback ? Explain Positive and Negative feedback. Explain the basic oscillator action using LC tank circuit.
Explain the Construction and Working of Colpitt's oscillator with suitable circuit diagram. 3 + 3 + 4

EITHER

2. (A) What is a multivibrator ? Explain the Construction and Working of the astable multivibrator using OP – AMP. Draw the necessary waveforms.

1 + 7 + 2

NTK/KW/15-5871

Contd.

OR

(B) What is instrumentation amplifier ? Explain the working of 3-OP-AMP instrumentation amplifier with suitable circuit diagram.
State its two applications. 8+2

EITHER

3. (A) What is D/A converter ? Explain the Working of Weighted resistor type D/A converter with suitable diagram.
What are the drawbacks of weighted resistor D/A converter ? 2+6+2

OR

(B) Explain the working of R-2R ladder type D/A converter with suitable circuit diagram.
List the limitations of R-2R ladder type D/A converter. 6+4

EITHER

4. (A) Explain the need of A/D conversion.
Define the following terms of A/D converter :
(i) range.
(ii) resolution.
(iii) speed.

Explain the working of single slope A/D convertor with suitable diagram. 1+3+6

OR

(B) Explain the working of dual slope A/D convertor with suitable circuit diagram.
State its advantages and disadvantages. 6+4

5. Answer any **Ten** subquestions :—

- (a) State the advantages of Wein bridge oscillator.
- (b) Name the different types of oscillator.
- (c) Draw the circuit diagram for NOT gate based crystal oscillator.
- (d) What is monostable multivibrator ?
- (e) What is sample and Hold circuit ?
- (f) What is linearity in D/A converter ?
- (g) Give any two advantages of OP-AMP used in R-2R ladder D/A converter.
- (h) What is resolution in D/A converter ?
- (i) State the factors deciding performance of A/D converter.
- (j) Why two comparators are used in single slope A/D converter ?
- (k) Can the analog i/p voltage be greater than reference voltage in dual slope A/D converter.
- (l) What is meant by ADC stability ?

1×10=10