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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

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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

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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

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