



Fourth

Semester B. Sc. Examination

ELECTRONICS**Paper-I****(Analog and Digital Techniques)**

Time : Three Hours]

[Max. Marks : 50

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

1. EITHER

- (A) Write a note on types of feedback and their applications.

State and derive Barkhausen criteria for oscillations.

5 + 5

OR

- (B) Explain the basic oscillator action. With neat diagram explain the working of Colpitt's Oscillator. 4+6

2. EITHER

- (A) Explain OP - AMP as an astable multivibrator. Derive the equation for its frequency. What is the necessary condition for asymmetric astable multivibrator ? 4+4+2



- (B) What is the need of an Instrumentation Amplifier ?
Explain the working of 3-OP-AMP instrumentation amplifier. 2+8

3. EITHER

- (A) What is the need of a DAC in an electronic measurement system ? Define range and resolution of a DAC. Give the working of weighted type DAC. 2+2+6

OR

- (B) Write a note on the types of DAC outputs. Give the working of R - 2R type DAC. Define Linearity and speed of DAC. 2+6+2

4. EITHER

- (A) Give the working of single slope ADC with suitable diagram. Compare the single slope ADC with counter type ADC with respect to its speed and resolution. 6+4

OR

- (B) State and explain sampling Theorem.
Explain 4 - bit flash type ADC. 3+7

5. Answer any ten subquestions :—

- (A) Draw the equivalent circuit of a piezo - electric crystal.
(B) State two advantages of Wein Bridge oscillator over phase shift oscillator.

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- (C) Give the types of oscillators based on frequency of output.
- (D) State the concept of Sample and Hold circuit.
- (E) State any two applications of Mono Stable Multivibrators.
- (F) What type of feedback is used in a mono stable multivibrator ?
- (G) State the principle of a dual bias DAC.
- (H) State if True or False — "DAC is an essential part of ADC".
- (I) State any two essential characteristics of the Op – AMP used in a DAC circuit.
- (J) State the principle of successive approximation type ADC.
- (K) What is meant by ADC stability ?
- (L) State if true or false — "Dual slope ADC is faster than single slope ADC".

$$1 \times 10 = 10$$