

**PART-A**

1. What is meant by (zero input) limit cycle oscillation?
2. Define 'dead band' of the filter.
3. What is product quantization error?
4. What are the two types of Quantization?
5. What is scaling?
6. State the need for scaling in filter implementation
7. What do you understand by input quantization error?
8. Express the fraction  $(7/8)$  and  $(-7/8)$  in sign magnitude, 2's complement and 1's complement?

**PART-B**

1. A second order system is described by  $y(n) = 0.35 y(n-2) + 0.92 y(n-1) + x(n)$

Study the effect of shift in pole locations with 4 bit coefficient representation in direct and cascade form realization.

2. a) Explain Briefly about various number representation in digital computer

b) Explain the finite word length effects in digital filters

- 3.i) Study the limit cycle oscillation and find the dead band of the filter

$$y(n) = 0.2 y(n-1) + 0.5 y(n-2) + x(n)$$

ii) Derive the signal to quantization noise ratio of A/D converter.

- 4.i) Study the limit cycle oscillation of the system which is defined as  $y(n) = 0.9y(n-1) + x(n)$  with zero input and  $y(-1) = 12$ . Determine the deadband of the system.

ii) Derive an expression for quantization error of input

***"Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do"— Pelé***

***"The optimist sees the rose and not its thorns; the pessimist stares at the thorns, oblivious to the rose." Kahlil Gibran***