

Duration: 3 hours

Total Marks: 80

Note: - 1) Each Question carry 5 Marks

2) Attempt any two Questions

Q.1 Attempt any two questions from the following

10

- (a) Explain: Even and Odd Signals
- (b) Explain in brief the various basic system properties?
- (c) Explain Exponential Fourier series with example.

Q.2 Attempt any two questions from the following

10

- (a) Find the Laplace transform of the following with ROC: $x(t) = u(t - 5)$
- (b) Explain properties of Laplace Transform.
- (c) Explain what discrete convolution is?

Q.3 Attempt any two questions from the following

10

- (a) Explain shift property of z-transform
- (b) Determine z-transform of $u(n - 5)$
- (c) Explain inverse z-transform

Q.4 Attempt any two questions from the following

10

- (a) Explain Trigonometric Fourier series with example
- (b) State and prove Integration in Time domain property of Laplace transforms.
- (c) State and prove initial value theorem of Laplace transforms

Q.5 Attempt any two questions from the following

10

- (a) What is BIBO stability?
- (b) Explain what do you understand by discrete time invariant systems
- (c) Explain how can the linearity of a discrete system be found out?

Q.6 Attempt any two questions from the following

10

- (a) Explain Fast Fourier transform (FFT)
- (b) What is discrete Fourier series?
- (c) Explain Overlap-Save (OLS) Method?

Q.7 Attempt any two questions from the following

10

- (a) What is an FIR filter? Compare an FIR filter with an IIR filter.
- (b) Discuss the magnitude and phase responses of digital filters.
- (c) Compare analog and digital filters. State the advantages of digital filters over analog filters.

Q.8 Attempt any two questions from the following

10

- (a) Write a note on discrete convolution
- (b) Write a note on system transfer function
- (c) Describe digital IIR filter characterization in z-domain.
