

B. Tech 4th Semester Examination
Pulse Shaping & Wave Generation (NS)
EC-224

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all by selecting one question each from sections A, B, C, D and section E is compulsory. All carry equal marks.

SECTION - A

1. Explain the low pass RC circuit. Derive the expression for the output voltage for sinusoidal input signal and draw its transfer characteristics. Also explain application of CRO probe. (20)
2. Explain the principle and working of Miller time base generator. Give its comparison with Bootstrap time base generator. (20)

SECTION - B

3. (a) Draw the circuit diagram for transistorized circuit clipping at two independent levels. Explain its working. (10)
(b) Design a clipping circuit that clips a sinusoidal signal at half of its negative peak. Draw the waveforms. (10)
4. (a) Discuss the principle and working of uni-directional sampling gate. Discuss its applications. (10)
(b) Design a clamping circuit which clamps a sinusoidal signal at positive peak and explain its working. (10)

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SECTION - C

- 5 (a) Describe LSI system. What will be the response of such a system to unit impulse response to a signum function? Draw the waveforms. (10)
(b) Derive the expression of convolution integral and give its significance. (10)
6. Explain causality and stability. Discuss its various considerations. Check if an LTI system with an impulse response $2^{-n}u(n)$ is stable system. (20)

SECTION - D

7. Discuss the properties of Z transform. Give its properties. Find the Z transform of the signal $x(n) = 2^{-n} u(n)$. (20)
8. Discuss the properties of Laplace transform. Determine the Laplace transform of $x(t) = e^{-(t+1)} \cos t$. (20)

SECTION - E

9. (i) Design a clipping circuit using diode and discuss its working.
(ii) What is the significance of a pole?
(iii) Give the working principle of current time base generator.
(iv) Give the response of RL circuit to impulse input.
(v) Discuss the significance of pedestal in gate circuits.
(vi) Discuss the effect of diode characteristics on clamping voltage.
(vii) What is the significance of convolution sum?
(viii) Find the ROC for $x(n) = 2^n u(n)$
(ix) Compare the LTI and LSI systems.
(x) Compare Bootstrap time base generators and current time base generators. (2×10=20)