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Roll No. :

328652(28)

B. E. (Sixth Semester) Examination, Nov.-Dec. 2021

(New Scheme)

(Et & T Branch)

ELECTRONIC CIRCUIT DESIGN

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) is compulsory and carries 2 marks and, attempt any two from part (b), (c) & (d) and carries 7 marks.

Unit-I

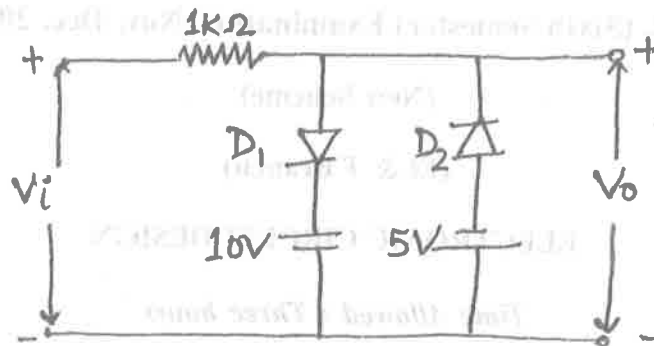
1. (a) Define Clipping Circuit.
(b) Draw the circuit of Square wave generator using OP-AMP and explain its operation by drawing the capacitor and output waveforms.

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- (c) Explain the operation of positive clamper circuit with proper circuit diagram and waveforms.
- (d) Draw output waveform for given circuit. Assume ideal diode. Input is 30 V sinusoidal signal.



Unit-II

2. (a) Explain the function of commutating capacitor in multivibrator.
- (b) With the help of a neat diagram and waveforms, explain the working of emitter-coupled monostable multivibrator.
- (c) Design an astable multivibrator to generate a square wave of 1 kHz frequency with the duty cycle of 25%. Assume Si transistors with $h_{fe} = 40$. Take

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$V_{CE(sat)} = 0.3 \text{ V}$, $V_{BE(sat)} = 0.7 \text{ V}$, $I_{B(actual)} = 1.5 * I_{B(min)}$ and when transistor in saturation $I_{C(sat)} = 5 \text{ mA}$ and $V_{CC} = 12 \text{ V}$.

- (d) What do you mean by resolution time? Explain methods of improving resolution.

Unit-III

3. (a) Define Duty Cycle.
- (b) Explain any two applications of 555 timer as a monostable multivibrator.
- (c) Draw the internal block diagram of 555 timer in astable mode and explain its operation.
- (d) Design a square wave generator of 1 kHz using 555 timer for duty cycle (D)

(i) $D = 25\%$

(ii) $D = 50\%$

Unit-IV

4. (a) What do you mean by bilinear transfer function?
- (b) Draw the lattice circuit for an all-pass filter. Also derive its transfer function.

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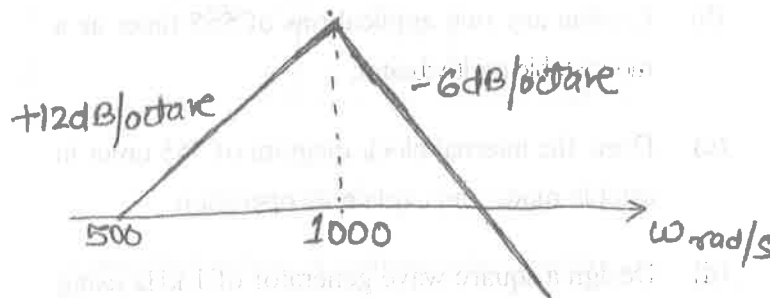
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- (c) Find out the component values for Z1 and Z2 from

$$\frac{6(s+0.5)}{(s+3)}$$

- (d) Figure shows the asymptotes of bode plot. Determine half power frequency, and transfer function $T(s)$ evaluating all constants.



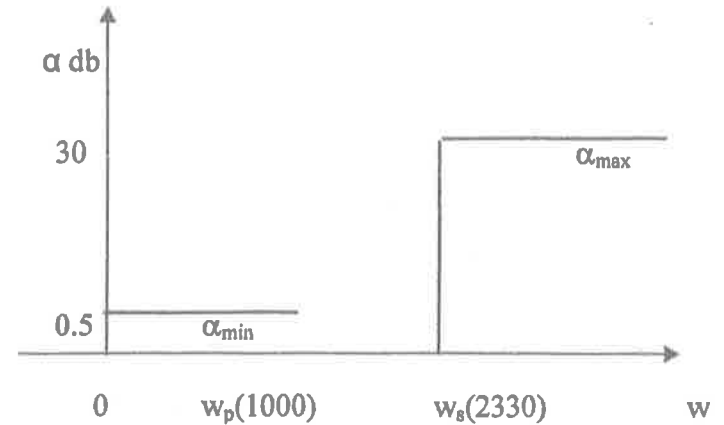
Unit-V

5. (a) What is the order of Butterworth low-pass filter?
 (b) What do you mean by RC-CR transformation?
 (c) Explain with circuit diagram the working of Sallen-key circuit.

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- (d) Design a low pass Butterworth filter for which



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