



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131754

Roll No.

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B.Tech.

(SEM. VII) (ODD SEM.) THEORY
EXAMINATION, 2014-15
FILTER DESIGN

Time : 3 Hours]

[Total Marks : 100

Note: Attempt all questions.

1 Justify the validity of any four of the following 5×4
with proper reasons.

- (A) Butterworth designing is maximally flat.
- (B) Operational amplifier is an active device.
- (C) Inductors cannot be simulated in IC's.
- (D) Integrators are preferred over differentiators.
- (E) Resistance can be simulated by switched capacitor filters.
- (F) Twin T network is a Notch filter.
- (G) If v_{BE} is base to emitter potential then there is difference among v_{BE} , v_{be} , V_{BE} and V_{be} .

2. Answer any two parts of the following. 10×2=20

- (A) Differentiate in between Butterworth & Chebyshev designing. Prove that third order Butterworth filter has roots on circle.

- (B) Find the Butterworth approximation for a LPF whose $A_{\max} = 0.5 \text{ dB}$, $\omega_p = 100$, & $\omega_s = 400 \text{ Hz}$.
- (C) Discuss frequency transformation techniques in detail.
3. Answer any two parts of the following **10×2=20**
- (A) Prove the sensitivity relation $x^{0.5} S^p = 2S^p_x$
- (B) Discuss positive feedback topology designing in detail. What is biquad?
- (C) Calculate the sensitivity of ω_p & Q_p for parallel RLC circuit.
4. Answer any two parts of the following- **10×2=20**
- (A) Discuss sallen key designing of a low pass filter in detail
- (B) Synthesize the transfer function $10(s^2+9000)/(s^2+5s+400)$ using feed forward three amplifier biquad techniques.
- (C) Discuss various realization techniques used for inductance substitution. Explain Riordan's circuit.
5. Write short notes on any four of the following **5×4=20**
- (A) Switched capacitor filter
- (B) Gyration
- (C) FDNR
- (D) Leap frog filter
- (E) Kerwin hulesman Newcomb (KHN) filter
- (F) Bilinear transformation
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