

**B.Tech. – VIEP – ELECTRONICS AND
COMMUNICATION ENGINEERING (BTECVI)**

Term-End Examination

June, 2018

00813

BIELE-004 : RF CIRCUITS

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **seven** questions. All questions carry equal marks. Missing data may be suitably assumed. Use of scientific calculators is permitted.*

1. Explain the characterization of the following IC components at Radio Frequency (RF) : 5+5=10
 - (a) Capacitors
 - (b) Transformers

2. Determine the transmission [ABCD] and the hybrid [h] matrix for a generic T-network when represented in 2-port network form. 5+5=10

3. Mathematically explain the noise model for the passive and the active components. 10

4. Explain the power constrained and noise optimization concept as applicable to design of high frequency amplifiers. 10

 5. What are mixers ? Explain, with the help of a neatly labelled circuit diagram, the operation of a multiplier based mixer. 3+7=10

 6. Explain the operation and derive the expression for the efficiency of a class-A power amplifier. 10

 7. With the help of neatly labelled circuit diagram and characteristic curve, explain the operation of a negative resistance oscillator. 10

 8. What are resonators ? Differentiate between resonators and oscillators. Explain static moduli synthesis. 2+3+5=10

 9. Write short notes on any **two** of the following : $2 \times 5 = 10$
 - (a) Phase Noise Considerations in Synthesizers
 - (b) Class-F Amplifiers
 - (c) Sub-Sampling Mixers
 - (d) Transmission Line at RF
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