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BIELE-004

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

Term-End Examination

December, 2018

00473

BIELE-004 : RF CIRCUITS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Missing data may be suitably assumed. All questions carry equal marks.*

1. (a) Discuss briefly the importance of radio frequency design. *5*

(b) Determine the radius of the AWG 26 wire, if the diameter of the AWG 50 wire is 1·0 mil (or $2{\cdot}54 \times 10^{-5}$m). *5*

2. (a) What is high frequency resistor ? Draw electric equivalent circuit representation for a high frequency wire wound resistor. *5*

(b) Discuss Transmission line theory. Also plot voltage distribution as a function of time and space. *5*

3. Derive voltage and current equation of the parallel plate transmission line. *10*

4. (a) Discuss classical two-port noise theory in RF design. *5*

   (b) Briefly discuss low frequency hybrid network description of a BJT. *5*

5. (a) Explain the key parameters of RF amplifier in terms of performance specification. *5*

   (b) With the help of block diagram, explain the key characteristics of mixers. *5*

6. (a) Explain the feedback oscillator design on the basis of Pi-type feedback. *5*

   (b) Discuss heterodyne receiver system incorporating a mixer. *5*

7. Define the following terms with mathematical expression : *4+4+2=10*

   (a) Intrinsic wave impedance

   (b) Phase velocity

   (c) Wavelength

8. Write short notes on any ***two*** of the following : *5+5=10*

   (a) LNA

   (b) Class A Power Amplifier

   (c) Modulation of Power Amplifiers

9. Explain the stability criteria of power amplifier. Also derive input stability and output stability circle equation. *10*

10. Discuss the design steps for low frequency Colpitts oscillator using h-parameters. *10*