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**M.E. / M.TECH. DEGREE EXAMINATIONS, MAY/JUNE 2017**

**SECOND SEMESTER**

**COMMUNICATION SYSTEMS**

**CU16202 – MIC AND RF SYSTEM DESIGN**

**(Regulation 2016)**

**Q. Code: 480931**

**Time: Three Hours**

**Maximum : 100 Marks**

Answer ALL questions

**PART A - (10 X 2 = 20 Marks)**

1. What is popcorn noise?
2. Compare homodyne and heterodyne receiver.
3. Why matching is essential? What is impedance matching?
4. Distinguish single ended and differential ended LNA.
5. List the steps for finding root locus.
6. Define ACPR Metric.
7. What is ripple factor of RF filter?
8. Differentiate Oscillator and Mixer.
9. Brief about two types of microwave integrated circuits?
10. Write a technical note on photonic bandgap antennas.

**PART B - (5 X16 = 80 Marks)**

11. (a) (i) Demonstrate MOS device physics in the short channel regime. (8)  
(ii) Define noise figure. Derive the expression for Noise Figure. (8)  
(OR)  
(b) (i) Briefly explain about phase noise. (4)  
(ii) Discuss about various Receiver Architectures and compare the performance metrics. (12)
12. (a) (i) Give the significance of impedance matching in RF ICs with an example. (12)  
(ii) Describe the impact of OC time constants in bandwidth estimation. (4)

**(OR)**

- (b) (i) Explain in detail about single ended and differential LNAs and compare its performance metrics. **(12)**  
(ii) Compare power match and noise match with respect to LNA topology. **(4)**
13. (a) (i) Explain various stability methods performed to improve system efficiency. **(10)**  
(ii) Describe the importance of gain and noise margin in stability measures. **(6)**
- (OR)**
- (b) (i) Describe the principles of class D, E and F amplifiers with neat diagrams. **(12)**  
(ii) Describe any one linearization technique. **(4)**
14. (a) (i) Describe in detail about the realization of any one special filter. **(8)**  
(ii) Examine the condition for oscillation in LC tank based microwave oscillator. **(8)**
- (OR)**
- (b) (i) Describe in detail about RF directional couplers and Hybrid couplers. **(10)**  
(ii) Explain the concept of simple PLL with a suitable diagram. **(6)**
15. (a) (i) Explain in detail about various steps involved in the fabrication of MIC components. **(12)**  
(ii) List the applications of MIC technology. **(4)**
- (OR)**
- (b) (i) Describe in detail about micro strip components and coplanar circuits. **(6)**  
(ii) Explain in detail about thermal and cryogenic measurements. **(10)**