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Question Paper Code : X86428

M.E./M.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021

Second Semester

Applied Electronics

AP5073 – RF SYSTEM DESIGN

(Common to Electronics and Communication Engineering)

(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions.

PART – A   (10×2=20 Marks)

1. Define IP2 and IP3.

2. Classify the different types of noise in MOSFET.

3. List the importance of open circuit time constant in designing amplifiers.

4. Apply S parameters on a sample two port network and give input and output relations.

5. Define ACPR Metric.

6. Why root locus technique is necessary ?

7. Distinguish between oscillator and Mixer.

8. Compare the types of mixer based on conversion efficiency.

9. Name the building blocks of a second order and third order PLL.

10. Define Phase Noise.

PART – B   (5×13=65 Marks)

11. a) i) Demonstrate MOS device physics in the short channel regime.   **(6)**

    ii) Derive intrinsic MOSFET two-port Noise parameters.   **(7)**

(OR)

  b) Obtain the expression for Drain Current in Linear and Saturated region of MOSFET.

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12. a) i) List out the steps involved in computing the bandwidth of an arbitrary network. **(6)**

ii) How will you evaluate the accuracy of OC time constants. ? **(7)**

(OR)

b) Examine various stability analysis performed to improve system efficiency.

13. a) What is the need for compensation technique in amplifiers ? Explain any one in detail.

(OR)

b) List and explain the techniques used to analyse phase and gain margins.

14. a) Elaborate on negative resistance oscillator. Give an example.

(OR)

b) Explain the parameters of Conversion gain, Linearity and Isolation for Mixers.

15. a) Express the need and explain frequency synthesis.

(OR)

b) Analyse how the lock acquisition problem can be overcome with charge pump PLL.

PART – C **(1×15=15 Marks)**

16. a) Analyse feedback system with its stability in detail. Use appropriate expressions and diagrams.

(OR)

b) Carry out mathematical analysis for different types of noise matching circuits from the first principles.

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