Code No: RT22041 | **R13** | SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2018
ELECTRONICS CIRCUIT ANALYSIS
(Com. to ECE, EIE)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Explain frequency stability of an oscillator (4M)
   b) Draw and explain about crystal based oscillator. (4M)
   c) What are the characteristics of negative feedback amplifiers (4M)
   d) Define rise time and drive an expression for it. (4M)
   e) Define noise and indicate various types of noises in amplifiers. (3M)
   f) Classify different types of distortions possible in amplifiers. (3M)

PART –B

2. a) Draw the equivalent circuit of a common source amplifier at high frequencies. Derive the expression for voltage gain, input and output resistances. (8M)
   b) A common drain amplifier uses a MOSFET with the following parameters g_m = 2.5mA/V, r_d = 60kohms, C_{gs}= 4pF, C_{ds} = 2pF, C_{gd} = 3pF. The value of Rs = 100 K ohms. The amplifier operates at 30KHz. Find Voltage gain, input resistance, output resistance and input capacitance. (8M)

3. a) Derive the expressions for voltage gain, current gain, input and output resistances of a Darlington pair. (8M)
   b) Draw the circuit diagram of a two stage FET based RC coupled amplifier and derive an expression for voltage gain, input and output resistances. (8M)

4. a) A Common source FET amplifier has a load resistance of 600kOhms. The ac drain resistance of the device is 150kohms and the transconductance is $0.75mAV^{-1}$. Calculate the voltage gain of the amplifier. (8M)
   b) Discuss quantitatively the effect of mixing on input resistance. (8M)

5. a) Derive the frequency of oscillation of Colpitt's oscillator? What are the limitations of this oscillator? (8M)
   b) State and explain the Barkhausen criterion in sinusoidal oscillators. (8M)

6. a) What is a cross over distortion in power amplifier and suggest a remedy for it. (8M)
   b) Derive the expression for Maximum efficiency and working of transformer coupled Class Amplifier (8M)

7. a) With necessary diagram and explanation derive the expression for efficiency of a class C tuned amplifier. (8M)
   b) Explain various types of coupling of transformer used in double tuned amplifiers with necessary diagrams (8M)