Q.P. Code: 5313

(3 Hours) [Total Marks: 80]

N.B. : (1) Question No.1 is compulsory
(2) Solve any three questions from remaining questions.
(3) Assume suitable data if it is required.

1. Solve any Four questions:
   (a) Draw output waveform for following circuits.
      
      ![Waveform Circuit](image)

      8 Vpp, 1 kHz sine

   (b) Explain Wilson current source.

   (c) What are different biasing methods used for FET, explain self bias technique.

   (d) State and Explain Barkhausen criteria.

   (e) Derive expression for efficiency for Class A transformer coupled amplifier.

2. (a) Find $I_{cq}$, $V_{ceq}$, $R_i$ and $R_0$ for following circuit with $RC = 1.2 \, \Omega$.

        ![Circuit](image)

        $V_e = 10 \, V$

        $R_1 = 3,8 \, k\Omega$

        $R_2 = 10 \, k\Omega$

        $R_C = 500 \, \Omega$

        $E = 5 \, V$

        $\beta = 150$

   (b) Explain any one method for biasing for E-MOSFET.

3. (a) Find $A_v$, $R_i$ and $R_0$ for following circuit.

        ![Circuit](image)

        $V_m = 12 \, V$

        $R_1 = 2,2 \, k\Omega$

        $R_2 = 1 \, k\Omega$

        $I_{ds} = 8 \, mA$

        $V_0 = -3 \, V$

        $R_0 = 1,6 \, k\Omega$

TURN OVER

MD-Con. 8174-15.
5. (a) For the following diff-amp find $A_d$, $A_c$ and CMRR.  
   $$V_{in1} \quad 3V, \quad 10\Omega$$ 
   $$V_{in2} \quad 2V, \quad 10\Omega$$ 

   (b) Explain working of Class B push-pull power amplifier. What is cross over distortion?  

6. Write short notes on (any four)  
   (a) High frequency oscillator,  
   (b) Cascode amplifier,  
   (c) High frequency model for BJT  
   (d) Heat sinks  
   (e) Constant current source used in diff-amp.