S.E Sem IV (CBGS) EXTC. 23/11/15

AE – II

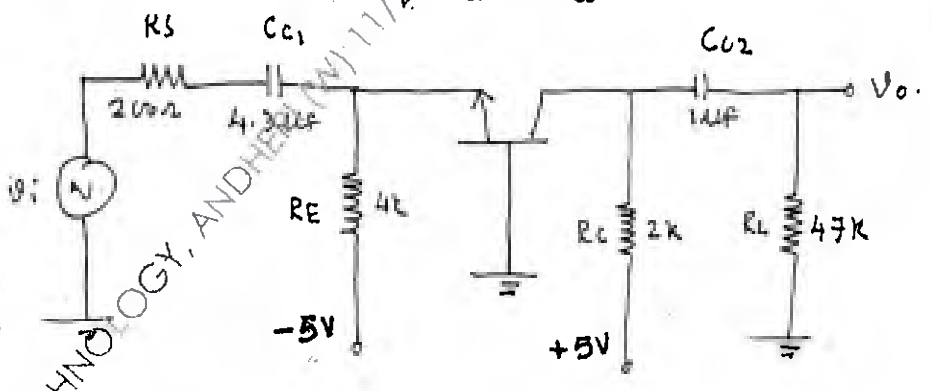
Q.P. Code : **5328**

(3 Hours) [Total Marks :80

N.B. : (1) Question **No.1** is **compulsory**
(2) **Solve** any **three** from remaining **five** questions.
(3) **Figure** to the **right** indicates **full marks**.
(4) Assume **suitable** data if **necessary**.

1. Solve Any **four**:- 20
   (a) In case of CE amplifier, Why does the bandwidth of amplifier decrease with increase in gain? Support the answer with relevent mathematical equation.
   (b) Instead of single Power Supply, why we use Dual power supply biasing for differential amplifier?
   (c) Why Efficiency of class A power Amplifier is less than class B.
   (d) What is the drawback of current mirror circuit using MOSFET? How it is overcome?
   (e) Why we prefer series voltage Regulator over shunt voltage Regulator? Explain in detail.

2. (a) The Parameters of transistor are $V_{BE} = 0.7V$ and $\beta = 100$, $V_A = 0V$, Determine 10
   (a) Q point of BJT
   (b) Time constant associated with C_{C1} and C_{C2}
   (c) Lower cut-off freq. due to C_{C1} and C_{C2}

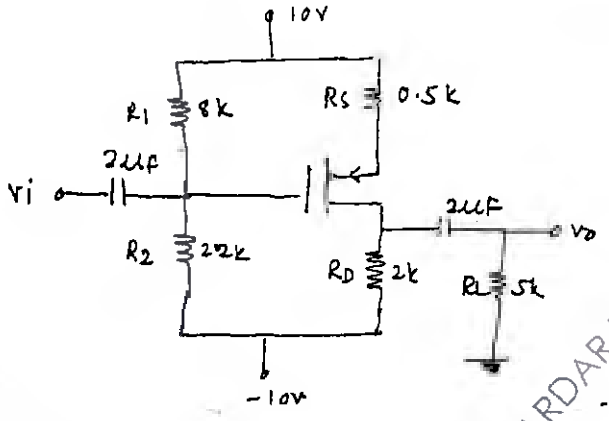


[TURN OVER

MD-Con. 8178-15.

(b) For the PMOS CS amplifier, transistor parameters are V_{TP} = -2V, Kp = 1 mA/V², λ = 0, Cgs = 15pf, Cgd = 3pf 10

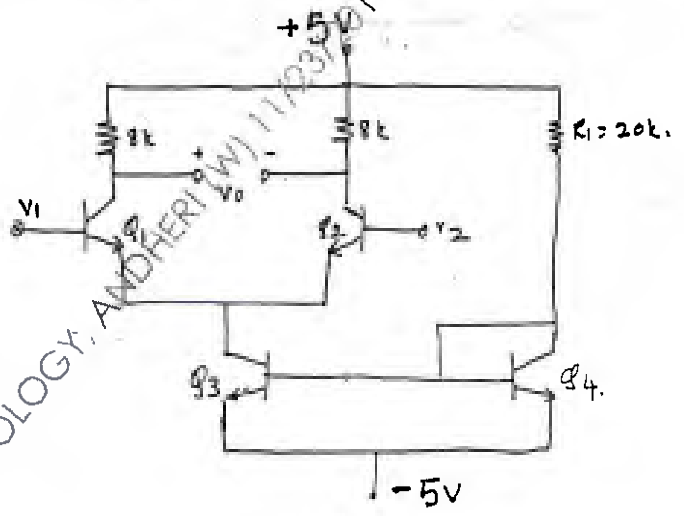
Determine (a) Equivalent Miller capacitance
(b) upper 3dB frequency



3. (a) For the given circuit, Determine 10

(i) Differential mode gain Ad
(ii) Common mode gain Ac
(iii) CMRR

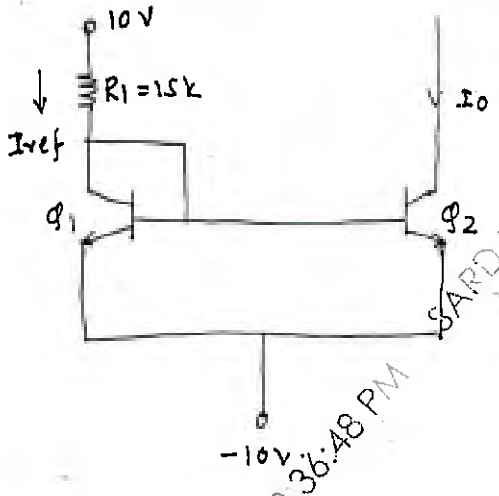
For BJT β = 100 V_{BE} = 0.7V, V_A = 100V.



[TURN OVER

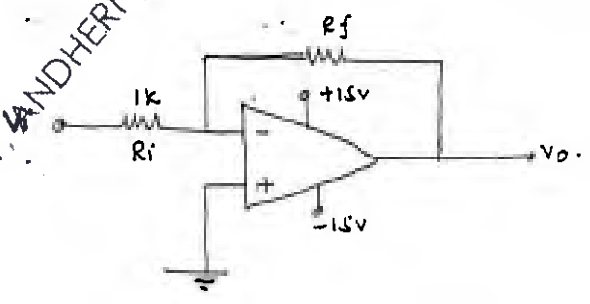
(b) Draw and explain the working of class A power amplifier (Transformer coupled). Derive the expression for efficiency. 10

4 (a) Draw and explain current mirror circuit using MOSFET, for the given circuit determine the value of I_{ref} and I_o. 10



(b) Draw the circuit diagram of darlington pair using BJT, and derive the expression for Av, Ai, Zi and Zo. 10

5. (a) For the given circuit, derive the equation for voltage gain A_f and find V_o for given cor 10



Vi	Vo	Ri	Rf
+1VDC	?	lK	10k
+1VDC	?	lK	100K
+1VDC	?	lk	1M

[TURN OVER

(b) Draw the circuit diagram of MOS differential amplifier and derive the expression for A_d, A_{cm} and CMRR. 10

6 Write short notes on (Attempt any **Four**.) 20

(a) High pass and low pass filter using OPAMP

(b) Cascode amplifier using BJT.

(c) Widlar current source using MOSFET.

(d) Transistor shunt voltage regulator

(e) High frequency hybrid-π model of BJT.
