

Solve the following questions.

Q1. Determine the quiescent currents and the collector to emitter voltage for a silicon transistor with  $\beta=60$  in the self biasing arrangement of the figure .The circuit component values are  $V_{cc}=20V, R_c=2K, R_1=100k, R_e=0.1K, R_2=5K$ . OR

3m

3m

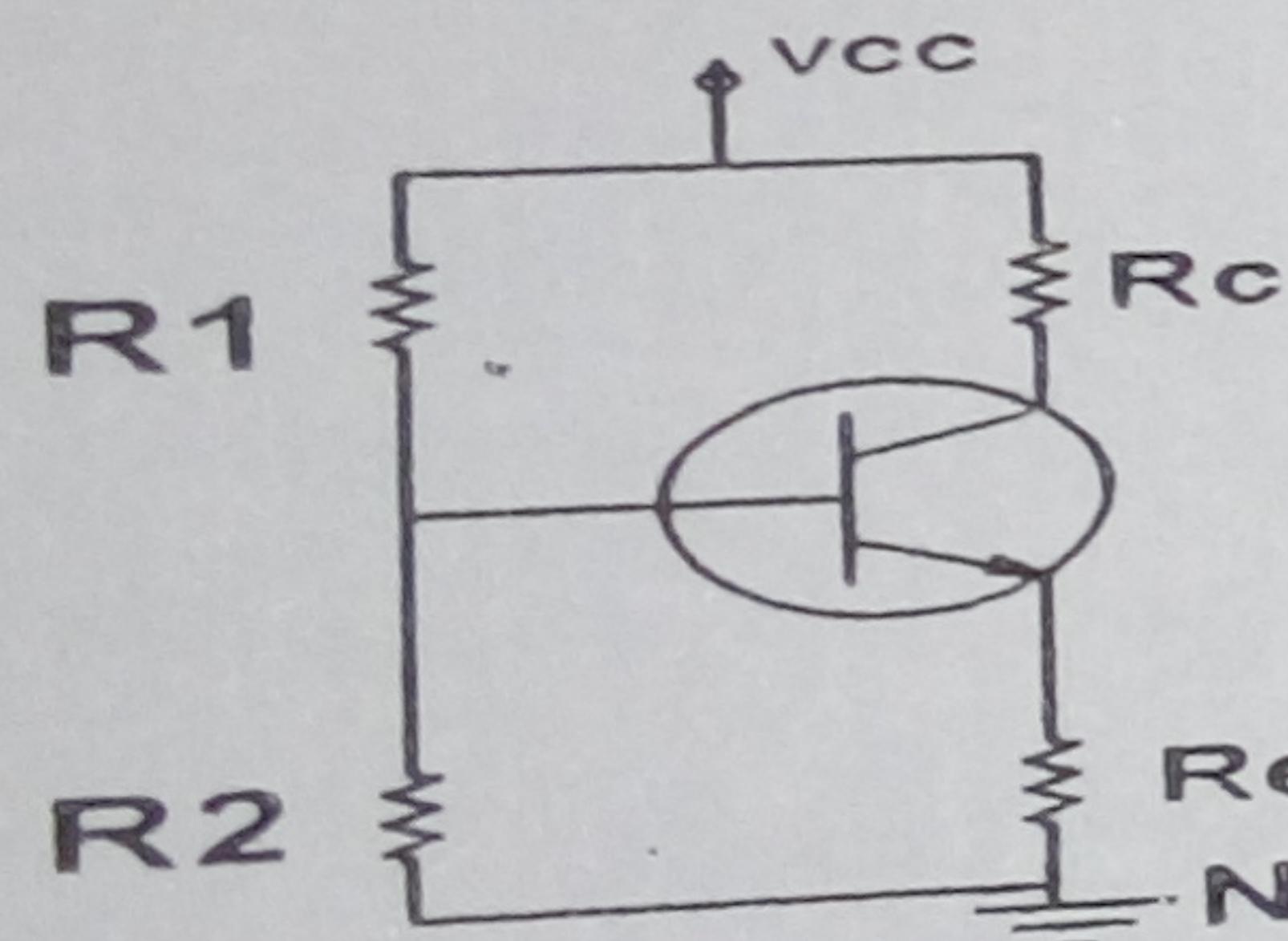
Q2)The readings obtained experimentally from JFET are as follows :

$V_{DS}$ in volts	5	12	12
$V_{GS}$ in volts	0	0	-0.25
$I_D$ in mA	8	8.2	7.5

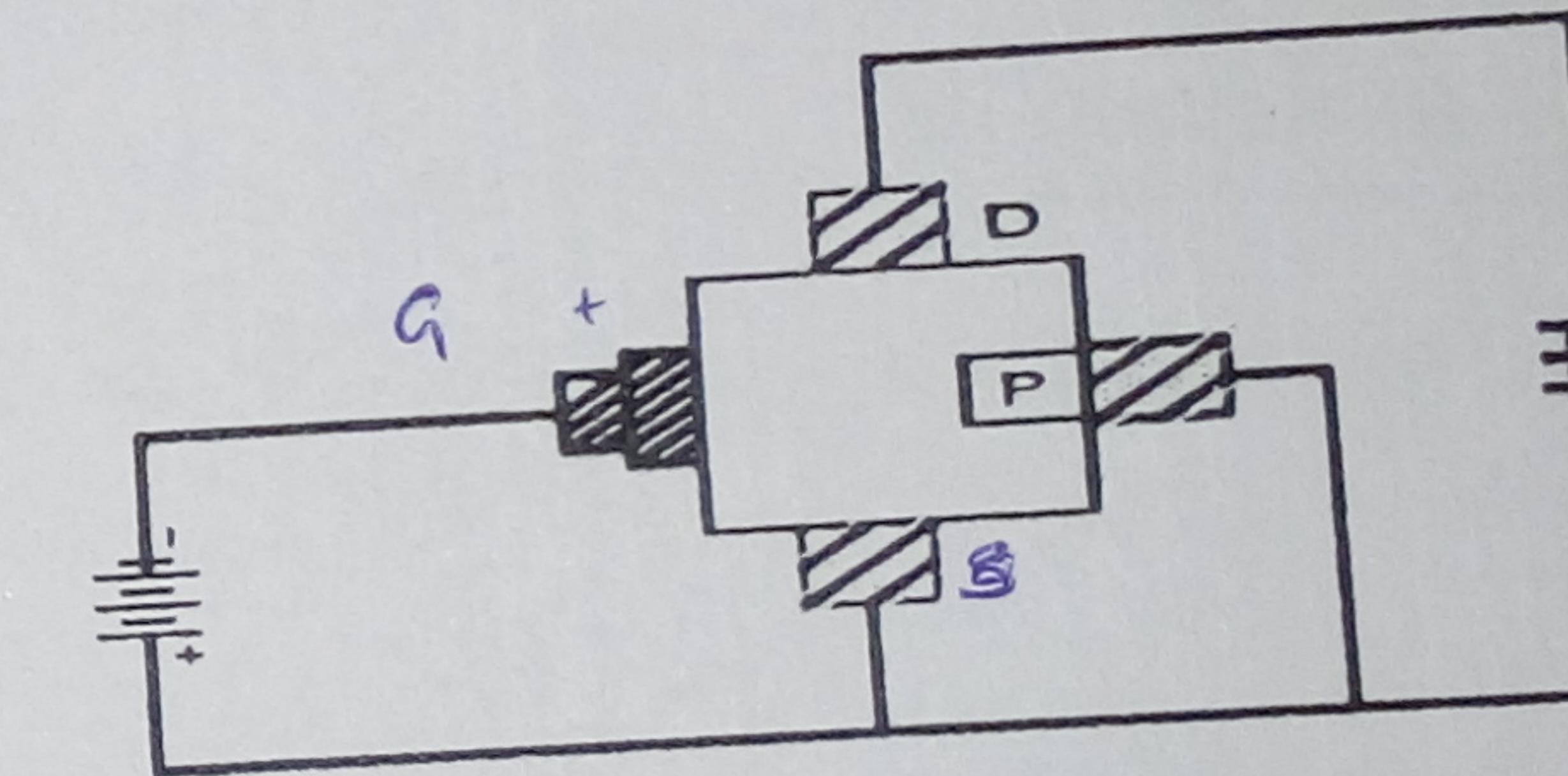
Determine (i) ac drain resistance (ii) transconductance and (iii) amplification factor.

4m

Q3)Identify the device shown in figure(B) and explain its working with characteristics?



(A) (Q1)



(B)

Q4)Derive the expression for collector current and base current for transistor in CE configuration in active region?

4m

Q5) With the help of diagram explain the working of self bias arrangement and determine operating point?

4m

**GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI**

(An Autonomous Institute of Govt. of Maharashtra)

**Electronics and Telecommunication Department**

Class Test:-2

Sub: ETU303 EDC

Solve any three

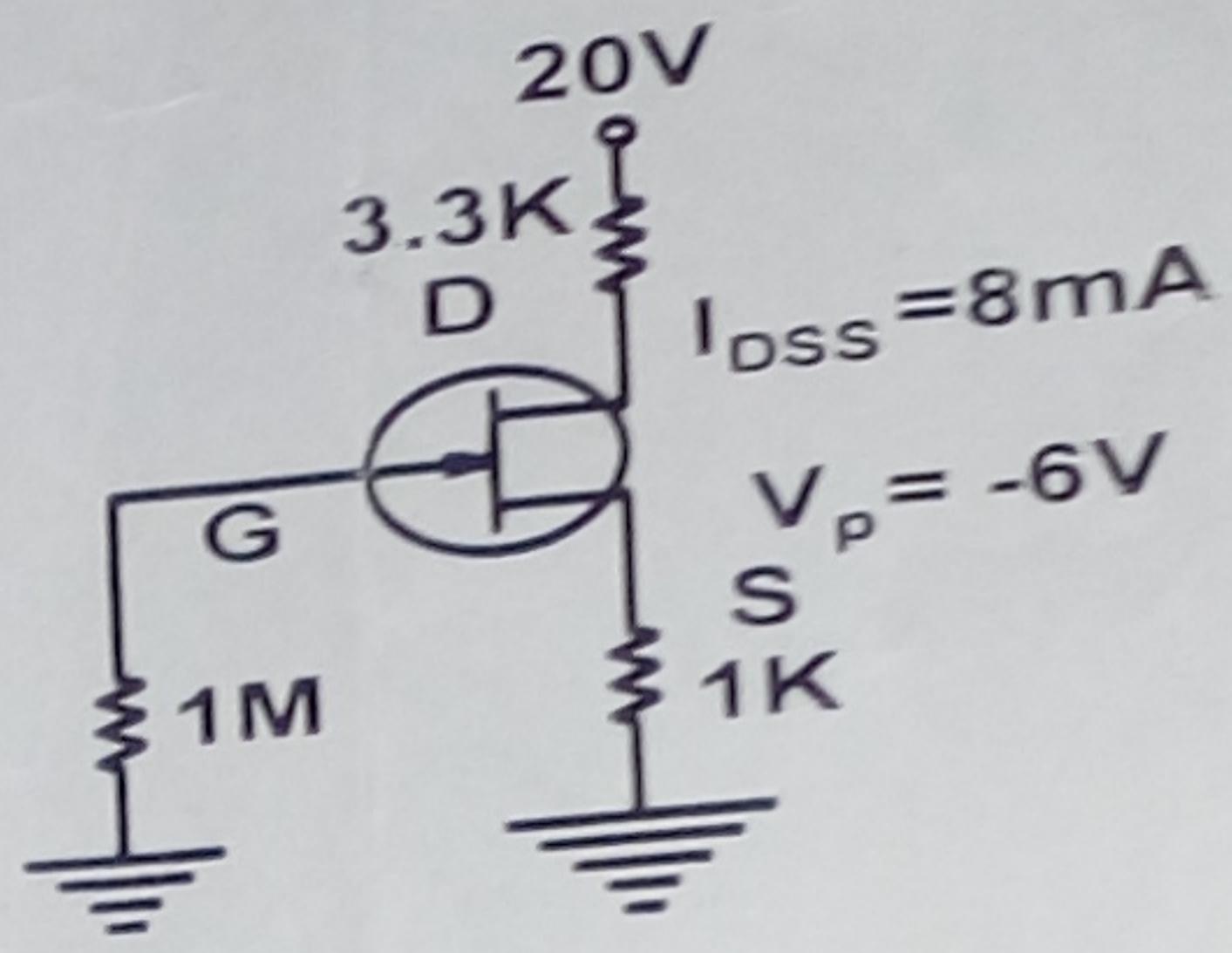
Marks:- 15

Date:-26/09/2014

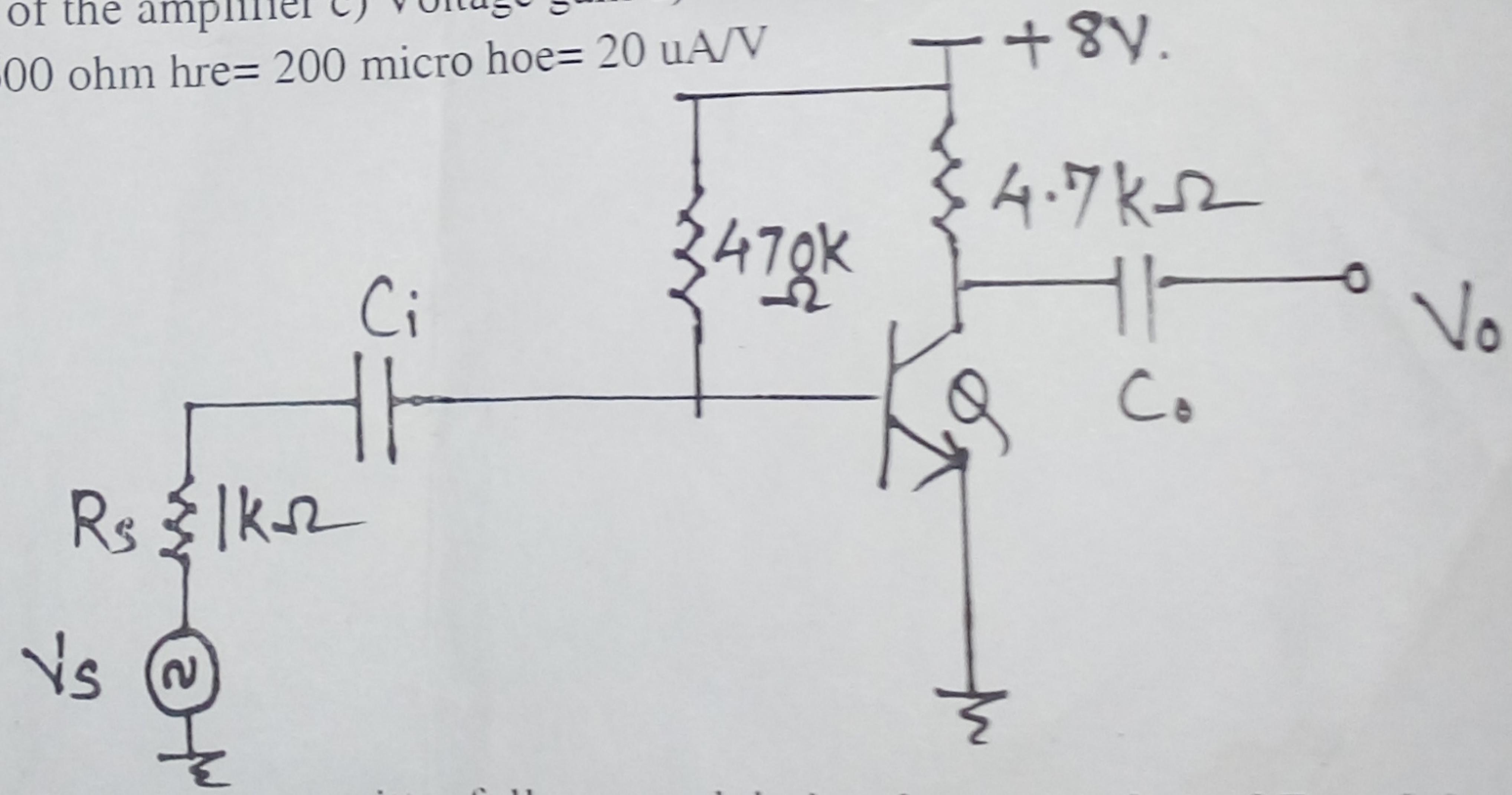
All questions carry equal marks

- 1) Discuss a) Fixed Bias b) Self Bias c) Voltage divider bias arrangements used for JFET amplifier circuits.

- 2) Determine the following for the network shown in figure.(i)  $V_{GS(Q)}$  (ii)  $I_{D(Q)}$  (iii)  $V_{DS}$  (iv)  $V_s$  (v)  $V_G$  (vii)  $V_D$ .



- 3) Giving appropriate reason justify the need of a emitter bypass capacitor. Also discuss the effect of an emitter resistance on the input impedance of a CE amplifier.
- 4) For the circuit shown determine the following a) i/p impedance of the transistor b) i/p impedance of the amplifier c) Voltage gain d) current gain e) o/p impedance.  
 $h_{FE} = 110$     $h_{ie} = 1600 \text{ ohm}$     $h_{re} = 200 \text{ micro}$     $h_{oe} = 20 \mu\text{A/V}$



- 5) Explain the need of Darlington emitter follower and derive the expression of  $Z_i$  and  $A_i$ . With appropriate diagram explain the need of Bootstrapping.