18-11-2013-DTP-P-7-RA-6

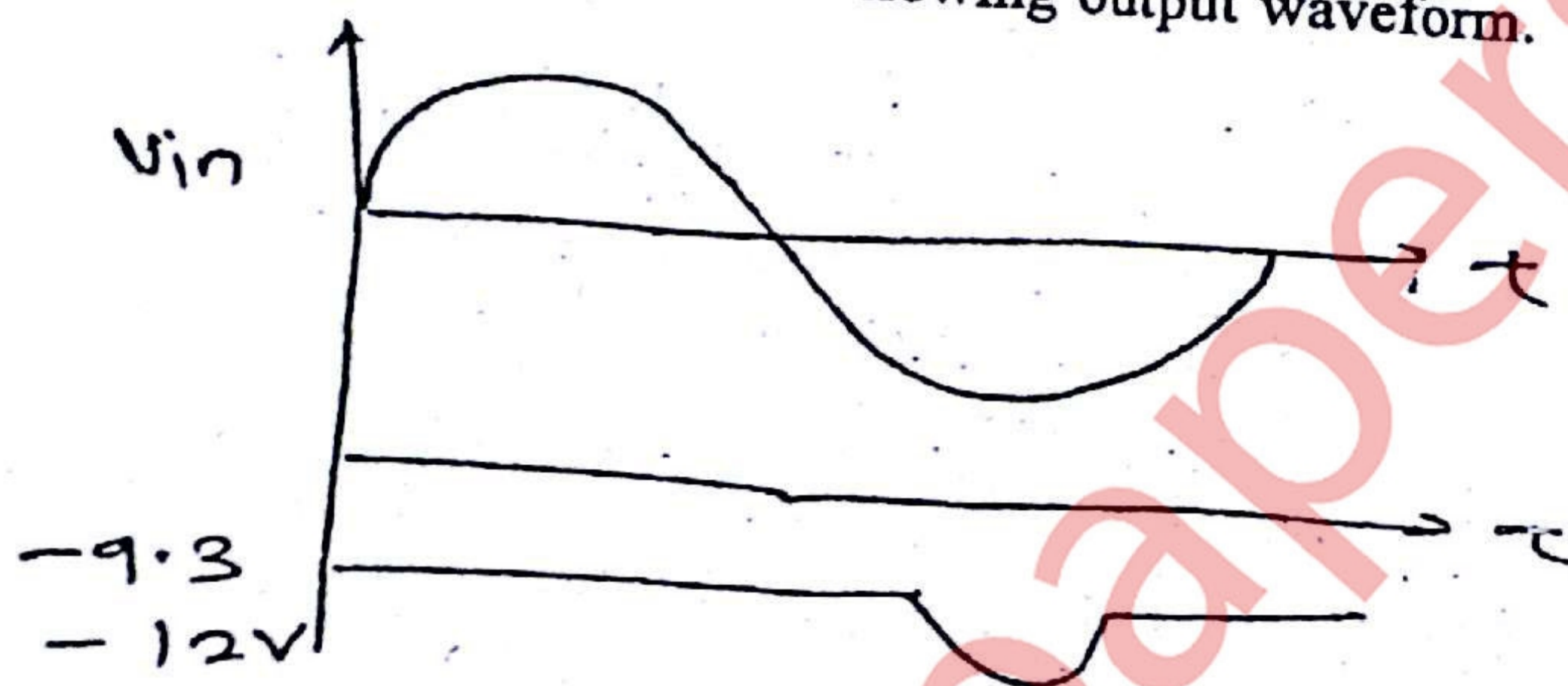Con. 8961-13.

(17)

GX - 12158

(3 Hours)

[Total Marks :80

N. B. :
(1) Question No. 1 is compulsory.
(2) Attempt any **three** out of **remaining five** questions.
(3) Assume **suitable** data wherever **necessary**.
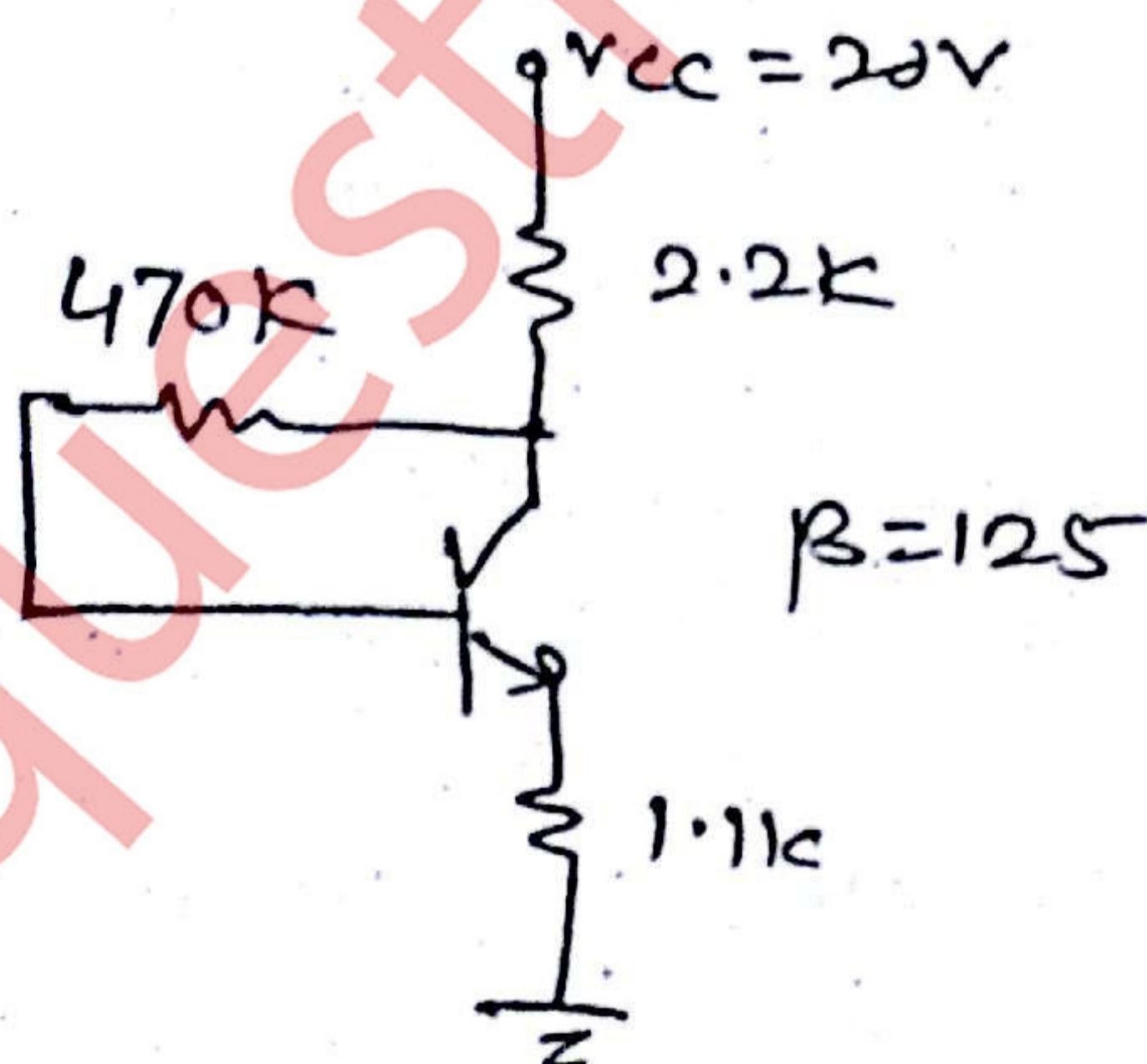
1. Attempt any **four** of following : –
   (a) Explain Avalanche and Zener breakdown
   (b) What is zero temperature drift?   20
   (c) Discuss working of enhancement MOSFET with characteristics and equation.
   (d) Design a clipper to give the following output waveform.

   (e) Calculate for the following circuit.
       (i) I_{B1}
       (ii) I_C
       (iii) V_{CE}
       (iv) BJT power consumption.

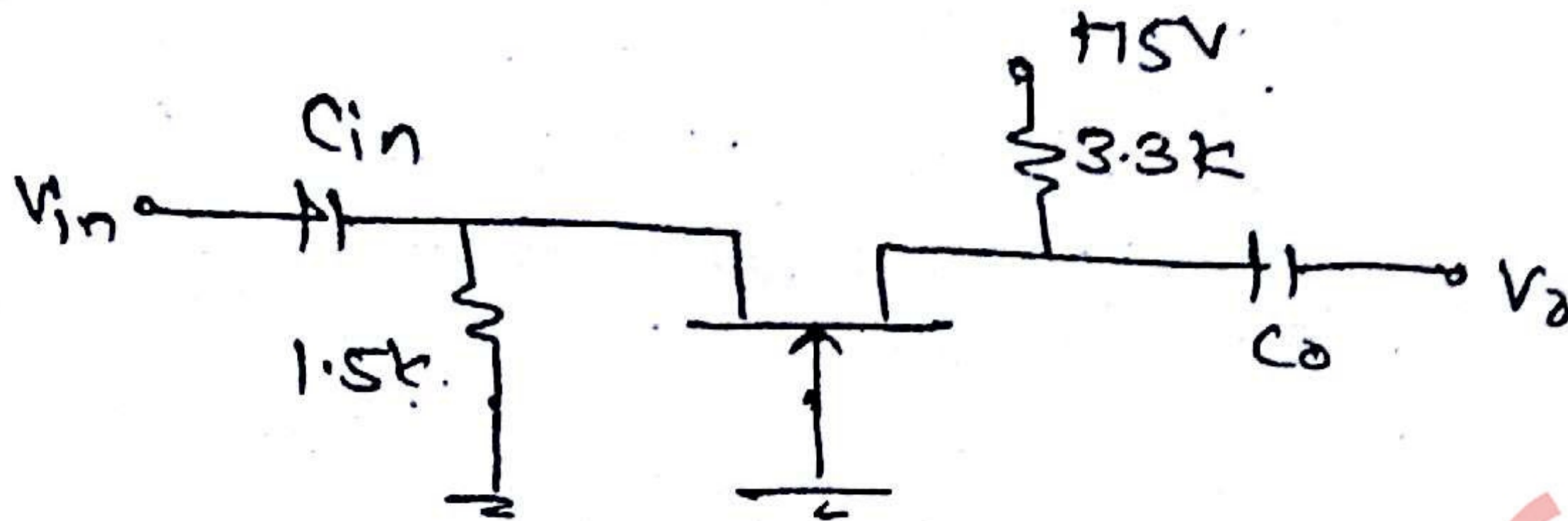2. (a) Draw various biasing schemes of BJT and calculate their stability factor.   10

[TURN OVER

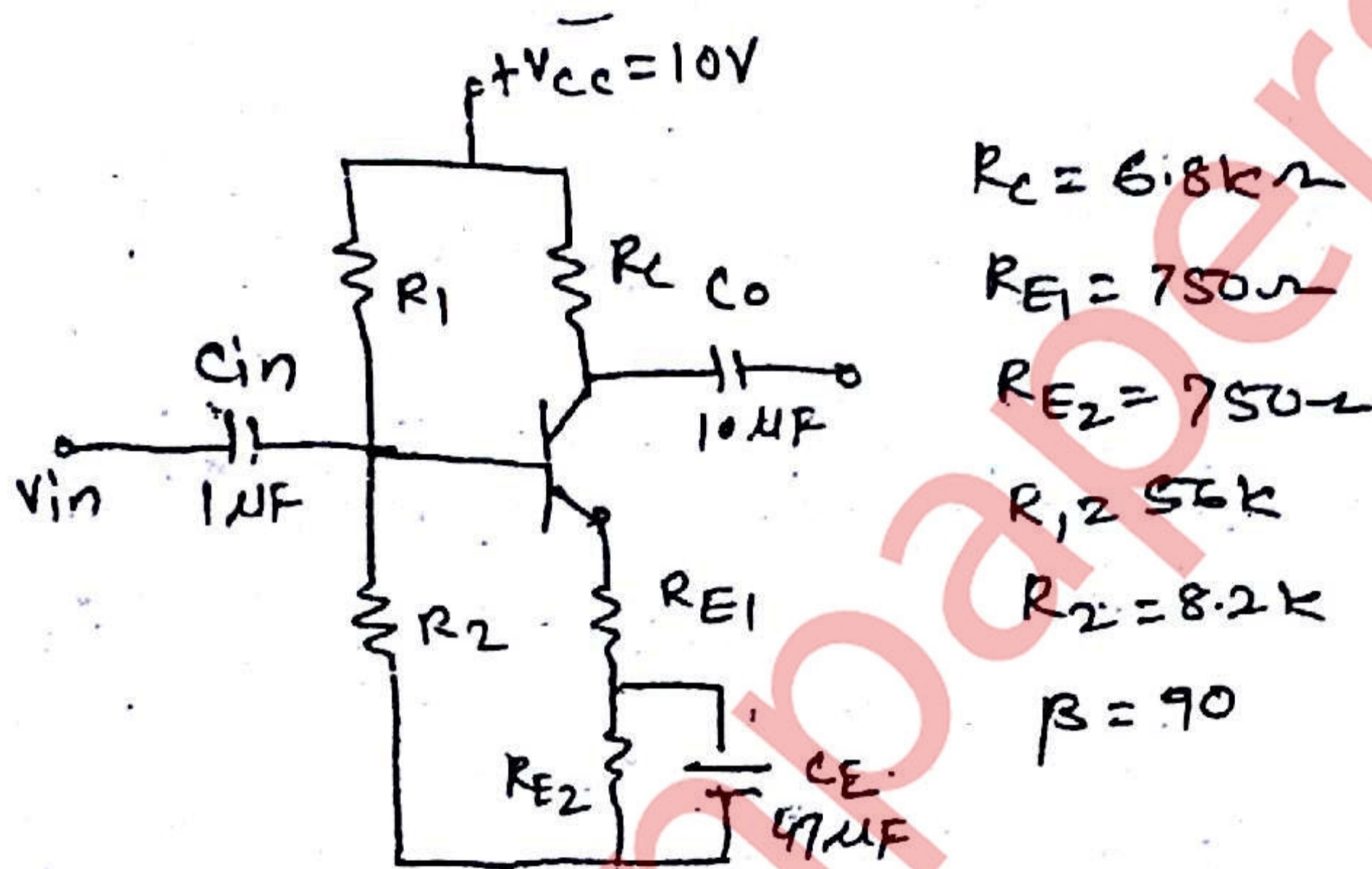(b)   10

Determine Z_{in}, Z_o and V_o, if
$V_{in} = 0.1$ mv, rd $= 40$ k Ω.

3. (a)   10

$R_c = 6.8$ kΩ
$R_{E1} = 750\Omega$
$R_{E2} = 750\Omega$
$R_1 = 56$ k
$R_2 = 8.2$ k
$\beta = 90$

Find Q-point and calculate Av, Zi, Zo
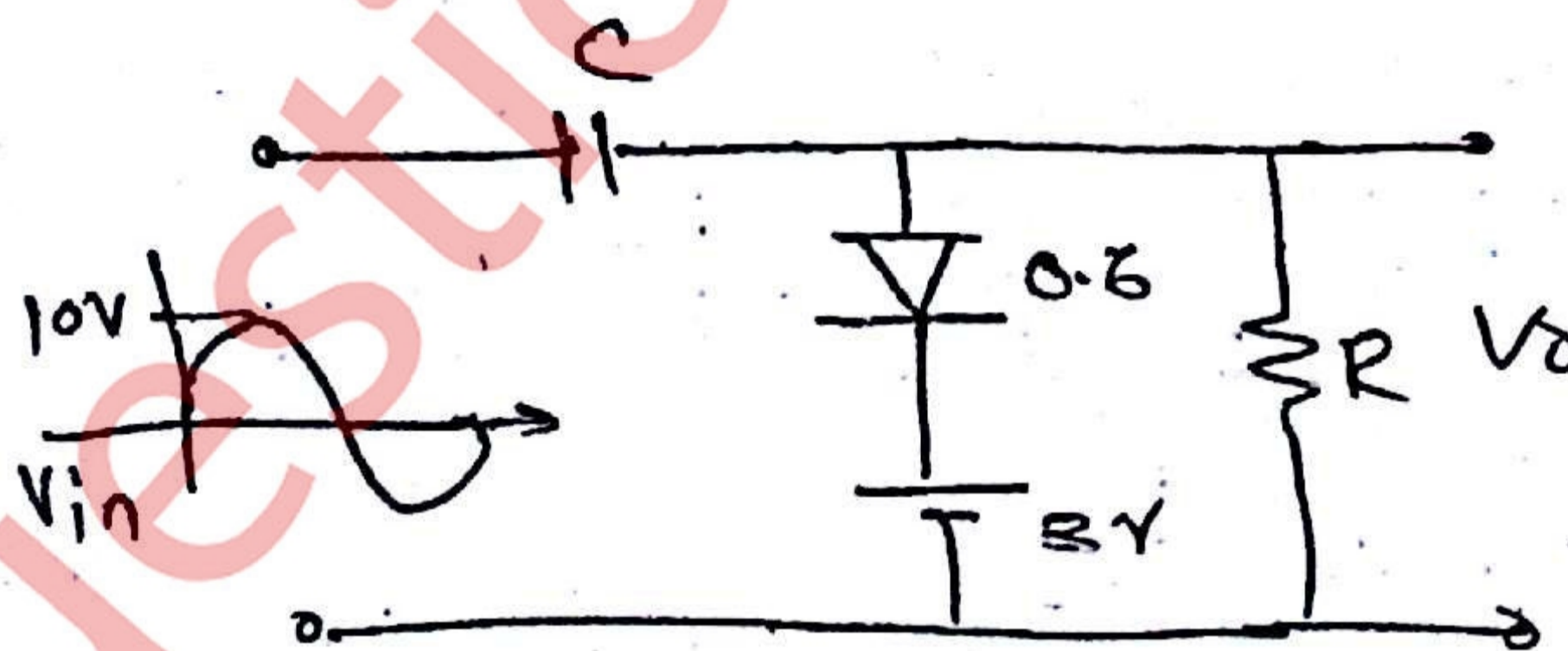
(b)   5

Explain with neat output waveform working of given circuit.

(c) Explain Thermal Runaway in detail.   5

4. (a) Design a single state RC coupled CE Amplifier to meet following specifications. 20
Use BC 147 B.

$|A_V| \geq 240$
$S \leq 10$
$f_L = 20$ Hz
$V_o = 2$ V
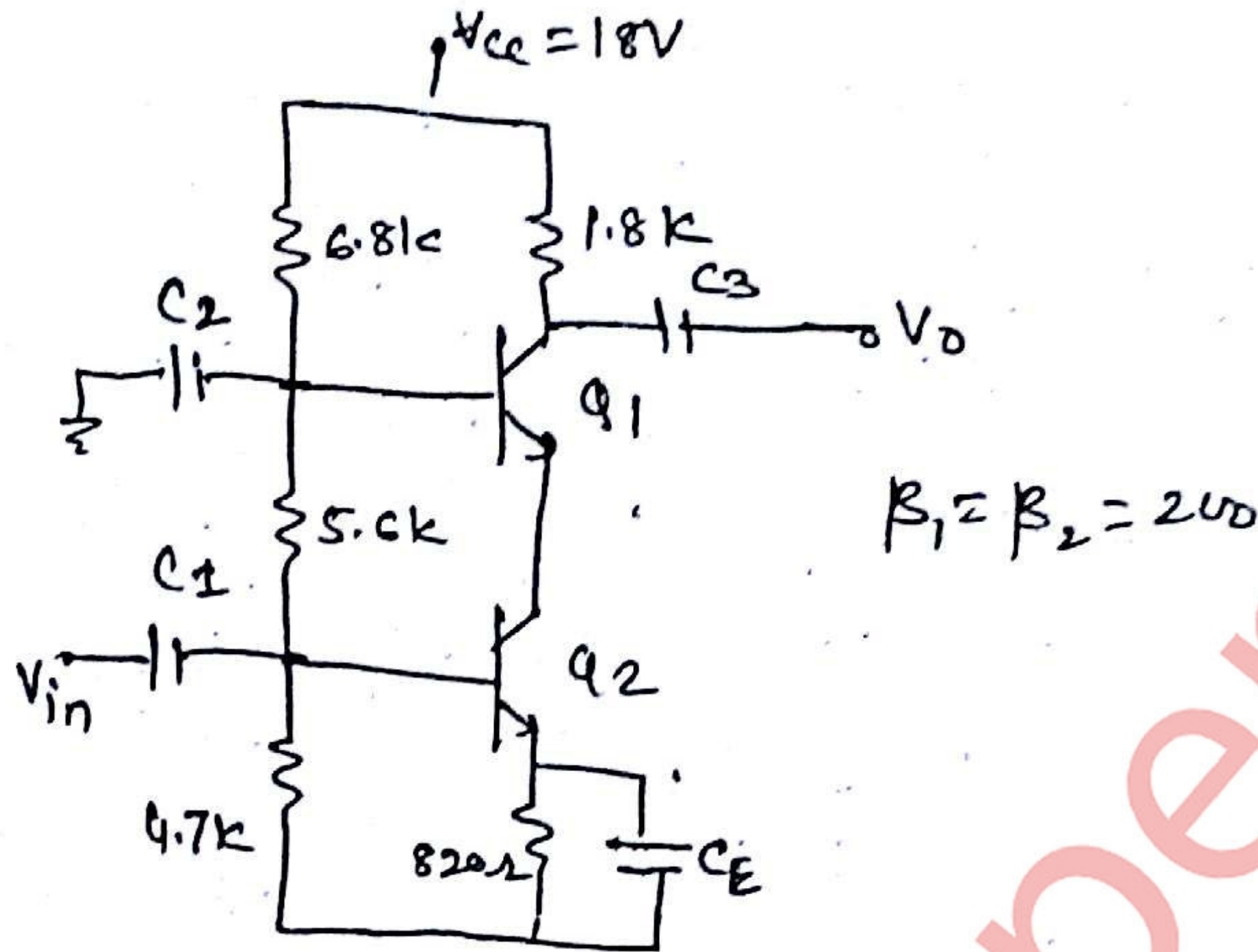
For the above designed Amplifier calculate Av, Zi, Zo.

[TURN OVER

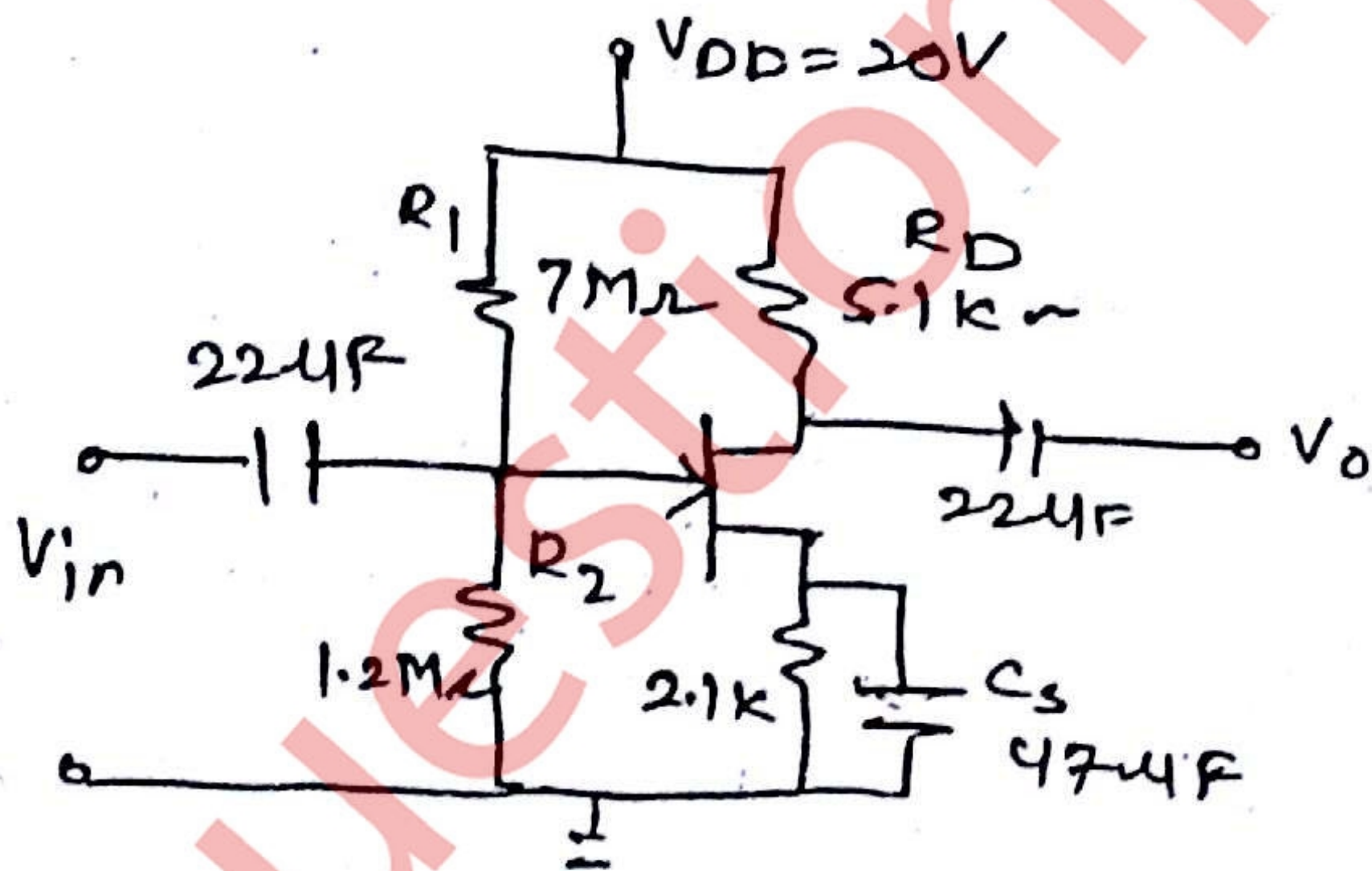5. (a) Determine Av, Ai and Zin for the following circuit.

10

$\beta_1 = \beta_2 = 200$

(b) Draw a neat diagram of JFET CG Amplifier. Derive expression for Av, Zi, Zo. 10

6. (a) Draw a neat diagram of BJT CE Amplifier with RE unbypassed and derive expression 10
   for Av, Zi, Zo, Ai.

   (b)

10

$I_{DSS} = 10mA$, $V_p = -3.5V$

For the above circuit calculate :

   (i) V_{DSQ}
   (ii) Av_1
   (iii) R_i, R_o
   (iv) F_L (Lower cut off freq.)