

**S.V.NATIONAL INSTITUTE OF TECHNOLOGY-SURAT**

**B.Tech. II (EC) 3<sup>rd</sup> Sem.**

**Sub: Electronic Devices and Circuits**

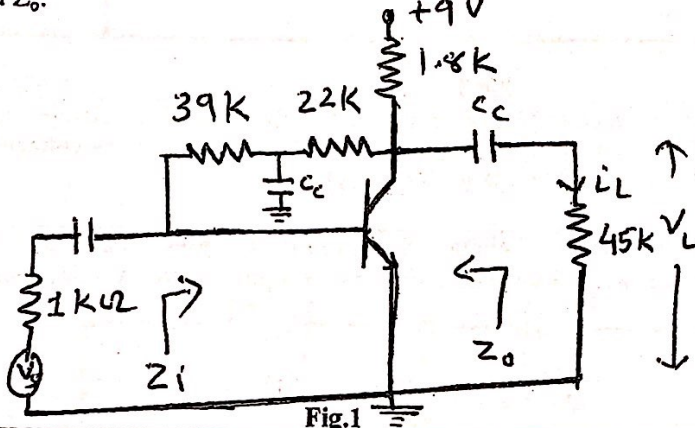
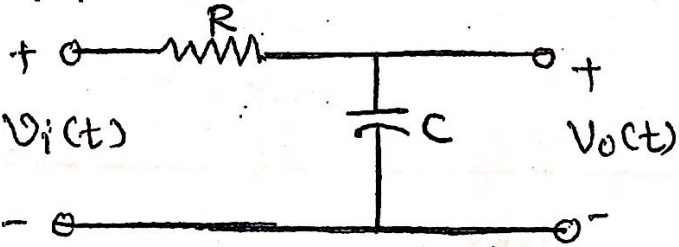
**END SEM EXAM DECEMBER-2012**

**Marks: 50**

**Instructions:**

**Time: Two Hour**

1. Attempt all questions.
2. Draw neat & clean circuit diagram/block diagram and waveforms.
3. Maintain the Sequence of Answer.
4. Assume data if necessary with proper justification.

Q.1	<p>For the circuit shown in Fig.1, Take <math>h_{fe}=80</math>, <math>h_{ie}=0.615K\Omega</math>, <math>h_{re}</math> and <math>h_{oe}</math> are neglected. Find <math>A_{vs}</math>, <math>A_{is}</math>, <math>Z_i</math> and <math>Z_o</math>.</p>  <p align="center">Fig.1</p>	08
Q.2	<p>Consider CE amplifier with <math>R_C=900\Omega</math>, <math>R_E=100\Omega</math>, <math>R_L=900\Omega</math>, <math>V_{cc}=10V</math>, <math>\alpha=0.99</math>, <math>V_{BE}=0.7V</math>. Find <math>R_1</math> and <math>R_2</math> for maximum Symmetrical swing. Draw DC and AC load line.</p>	07
Q.3	<p><b>Attempt Any Two:</b></p>	10
(a)	<p>Draw the circuit diagram of emitter follower amplifier. Using the hybrid model prove that voltage gain of emitter follower is approximately one.</p>	(05)
(b)	<p>For transformer coupled class A power amplifier, maximum power of 5 watt is to delivered to the load with <math>R_L=4\Omega</math>. The Q point is adjusted for maximum symmetrical swing and <math>V_{cc}=20V</math>. Find the turns ratio N, peak collector current <math>I_{cm}</math> and efficiency <math>\eta</math>.</p>	(05)
(c)	<p>For a class B push pull amplifier providing a 22V peak signal to an <math>8\Omega</math> load and operate on 25V battery. Determine: (a) input dc power (b) output ac power delivered to load (c) collector circuit efficiency (d) power dissipated in each transistor. Take <math>N=1</math>.</p>	(05)
Q.4	<p><b>Attempt Any Two:</b></p>	10
(a)	<p>Draw and explain the construction, operation and static VI characteristics of IGBT.</p>	(05)
(b)	<p>For the circuit shown in Fig. 2, draw the output waveform for the <math>RC \gg T</math> and <math>RC \ll T</math> for the pulse and ramp input waveforms.</p>  <p align="center">Fig.2</p>	(05)
(c)	<p>Draw and explain the construction, operation and static VI characteristics of UJT.</p>	(05)

Q.5 Attempt Any Three:

- (a) For the circuit shown in Fig. 3, explain the operation, plot the output waveform and the transfer characteristics. (05)

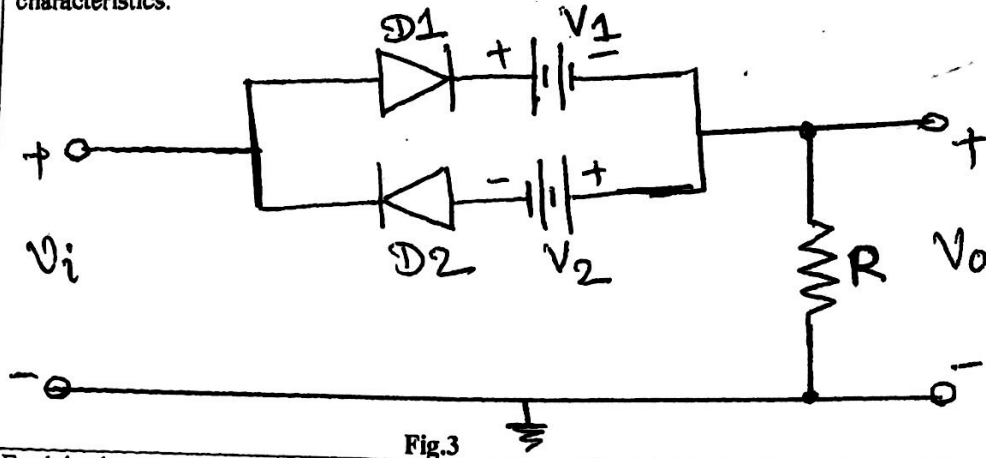


Fig.3

- (b) Explain the operation of negative clamper circuit. Also, design a diode clamper to restore the positive peaks of 1KHz input signal to a voltage level to 5 V. Assume the voltage drop across diode as 0.7 V,  $R_f = 200 \Omega$ ,  $R_r = 500 K\Omega$  and  $RC = 25T$ . (05)

- (c) The input voltage  $v_i$  to the two-level clipper shown in Fig. 4, varies linearly from 0 to 150 V. Sketch the output voltage  $v_o$  to the same time scale as the input voltage. Assume ideal diodes. (05)

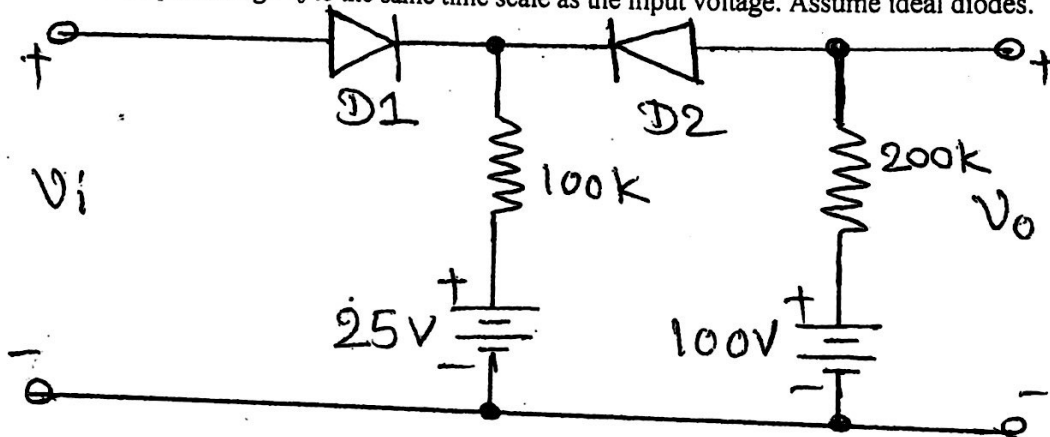


Fig.4

- (d) For the circuit shown in following Fig. 5, explain the working, draw the output waveform and the transfer characteristics. (05)

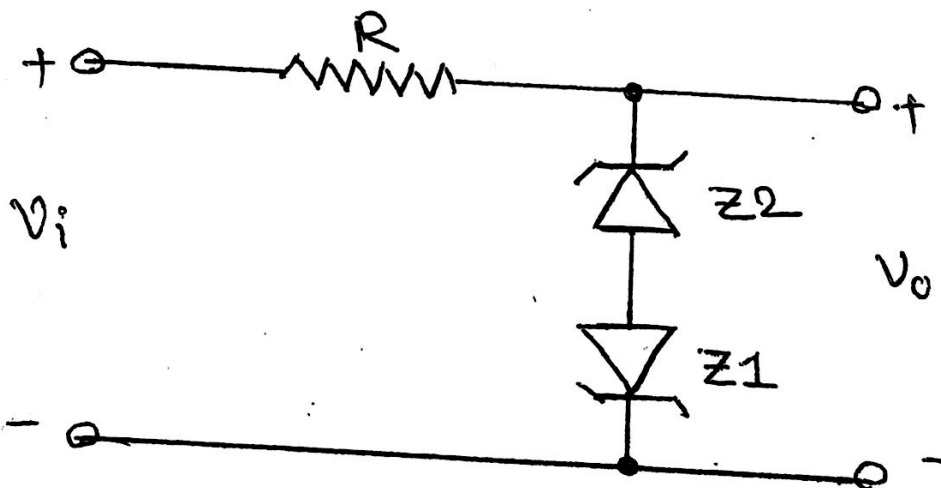


Fig.5

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