



UF-6169

B. E. - II (Sem. III) (Computer) Examination

May / June - 2012

Linear Electronics - I

Time : 3 Hours]

[Total Marks : 100

Instructions : (1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવાહી પર અવશ્ય લખવી.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. - 2 (SEM. 3) (COMPUTER)

Name of the Subject :
LINEAR ELECTRONICS - 1

Subject Code No. : 6 1 6 9 Section No. (1, 2,.....): NIL

Seat No. :

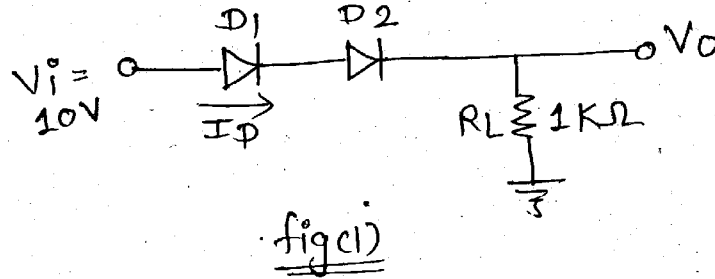
Student's Signature

- (2) Assume suitable data wherever required.
- (3) Figures on right indicate marks.
- (4) Use of scientific calculator CASIO fx-82/83 or fx-100 or equivalent of other companies is allowed.
- (5) Attempt all questions.

1 (a) Answer the following : 10

- (i) The PIV of full wave centre tap rectifier is _____.
- (ii) What is diffusion capacitance ?
- (iii) In transistor, the base is very _____ doped.
- (iv) For Ge diode, $V_D =$ _____
- (v) Ripple factor for HWR is _____.
- (vi) What do you mean by extrinsic semiconductor ?
- (vii) _____ are the majority charge carriers for N-type material.
- (viii) Draw the piecewise linear VI-Characteristic of SI diode.
- (ix) Value of α should be above _____.
- (x) The voltage gain of CE amplifier is _____ than CC amplifier.

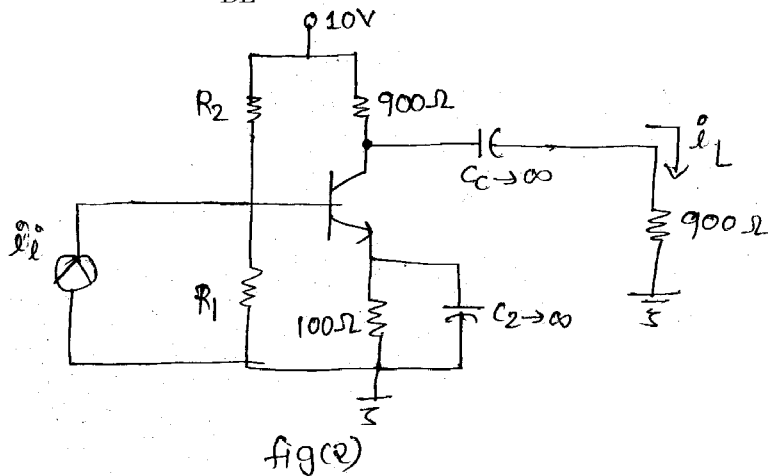
- (b) (i) Explain the concept of dynamic resistance. 6
(ii) Find out V_O , V_{D1} , V_{D2} and I_D for the circuit shown. 4
Take $V_r = 0.7V$ and neglect R_F for D_1 and D_2 .



- 2 (a) For a full wave centre tap rectifier, derive the equation of V_{dc} , I_{dc} , P_{dc} , I_{rms} , η and ripple factor. 10
(b) Draw and explain the CB configuration of NPN transistor. 5

OR

- 2 (a) For a zener regulator ckt, find out the range of R_L and I_L that results in voltage of 10V across load resistor. Determine the maximum wattage rating of the diode. $V_{in} = 50V$, $I_{zmax} = 32mA$ and $r_i = 1K\Omega$. 7
(b) Draw and explain the capacitor filter for full wave rectifier. Derive the equation of ripple factor. 8
- 3 (a) Draw and explain the voltage divider biasing method for CE translator. Derive the expression of I_C and V_{CE} . 8
(b) For the given ckt, find out R_1 and R_2 for maximum symmetrical swing. Draw AC and DC load lines and also sketch the maximum undistorted i_L . 7
 $\alpha = 0.99$ and $V_{BE} = 0.7V$



OR

- 3** (a) Explain infinite coupling capacitor. **7**
- (b) Explain how current amplification takes place in the transistor. **6**
- (c) Draw the O/P characteristic of CE configuration. **2**
- 4** (a) Attempt the following : **10**
- (i) What do you mean by transistor biasing ?
- (ii) Why is Bootstrapping usually employed ?
- (iii) Define : Thermal resistance.
- (iv) What are the frequency range of DC, Audio, Video and RF amplifiers ?
- (v) Drawback of ICs.
- (vi) IC generally made up of _____.
- (vii) Which semiconductors are used in fabrication of ICs ?
- (viii) What are the applications of CB, CC and CE configuration ?
- (ix) Define : Stability factor.
- (x) What happen with the gain if the number of transistor cascading transistors are increases ?
- (b) Attempt any two : **10**
- (i) What do you mean by thin film and thick films ICs ?
- (ii) Explain Cascode Amplifier.
- (iii) Explain Phase splitter circuits.
- 5** Write short notes : (any three) **15**
- (i) Explain Bootstrapping.
- (ii) Explain the effects of the temperature on Q point.
- (iii) Explain Darlington amplifier.
- (iv) Explain Two stage RC coupled amplifier circuit.

6 Attempt any three :

15

- (i) Using the stability factors S_{β} find values for R_e and R_b such that the voltage across R_c will not vary more than $\pm 0.5V$ as β varies from 50 to 200. The quiescent current is to be about 10 mA. Take $R_c = 1 K\Omega$, $V_{BE} = 0.7V$.
 - (ii) Explain in detail the fabrication of a resistor on a portion of a substrate of a monolithic IC.
 - (iii) Explain class B push pull amplifier,
 - (iv) Two Diode compensation.
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