



SE-6185

B. E. II (EC/ECC/IC) (Sem. III) Examination

April / May - 2011

Electronics Devices & Circuits

Time : Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उतरवडी पर अवश्य लपवी.
 Fillup strictly the details of signs on your answer book.

Seat No. :

Name of the Examination :

Name of the Subject :

Subject Code No. : Section No. (1, 2,.....):

Student's Signature

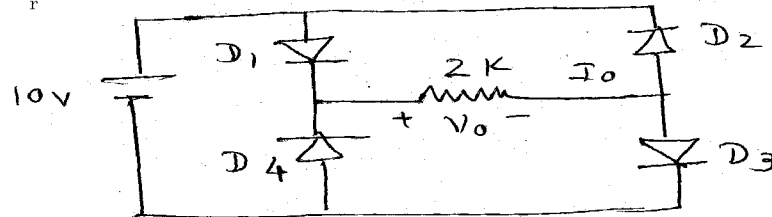
- (2) Attempt all questions.
- (3) Assume data if necessary.
- (4) Figures to the right indicates full marks.
- (5) Programmable calculators are not allowed.

1 (a) Answer the following : 10

- (i) What is operating point ? What is its position on characteristics to get maximum advantage ?
- (ii) Define TUF and ripple factor.
- (iii) Compare zener diode and conventional PN diode.
- (iv) Why biasing is required ?
- (v) BJT is current controlled or voltage controlled device ? Justify your answer.

(b) Why filters are required ? Explain in brief different types of filter circuits. 6

(c) For the given circuit find V_o and I_o . All diods have $V_r = 0.7V$.



(Fig. -1)

2 Attempt any two : 12

- (a) Write a short note on Schottky diode.
- (b) Derive the equation for dynamic resistance using small signal analysis of diode circuits.
- (c) An 8V zener diode is used in regulator circuit and the load current vary from 12 to 100 mA. Find the value of resistance r_i to maintain a constant voltage across the load. The input voltage is 12 V and minimum zener current is 10 mA. Find power rating of zener diode.

3 Attempt any two : 16

- (a) Explain full wave bridge rectifier with necessary diagram and derive the equations for efficiency, PIV, ripple factor, form factor.
- (b) Explain voltage divider biasing and fixed biasing circuit along with necessary equations and circuit diagram.
- (c) Find R_C in given circuit for maximum symmetrical output voltage V_L . Take $\beta = 100$, $V_{BE} = 0.7V$.

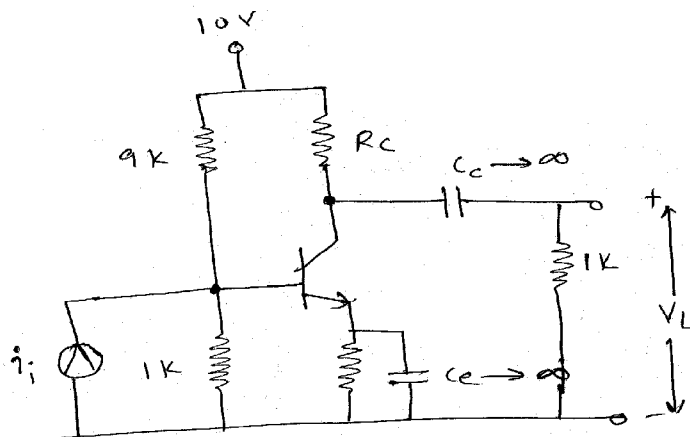


Fig. 2

4 (a) Attempt the following : 10

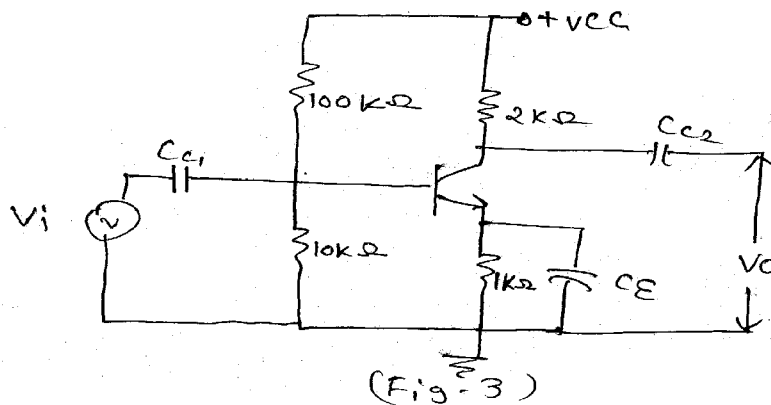
- (1) _____ amplifier having position of Q point below the cutoff.
- (3) Bandwidth of a cascaded amplifier is _____ than that of a single stage amplifier.
- (3) The change in _____ with change in frequency is called as frequency distortion.
- (4) The _____ half cycle of the output voltage will get distorted if the Q point is near saturation.

- (5) The value of stability factor(s) should be as _____ as possible.
- (6) A _____ configuration does not need the thermal stabilization.
- (7) In complementary symmetry class B amplifier, both the transistors are operated in _____ configuration.
- (8) To avoid core saturations, the primary current should have α _____ de value.
- (9) In the hybrid model W stands for _____ .
- (10) The voltage gain of a practical emitter follower is _____ .

- (b) Draw the circuit for collector - base bias and emitter stablized bias circuits. 2
- (c) Draw the circuit for transformer coupled class A amplifier _____ . 2
- (d) Compare clas B push - pull and complementary symmetry amplifier circuits. 6

- 5 (a) Attempt any **one** : 7
- (1) Short note on bootstrap emitter follower.
 - (2) Derive the steps of analysis of a C. E. amplifier with unbypassed RE for h - parameter.

- (b) Attempt any **two** : 8
- (1) A transistor used in the amplifier circuit shown in fig. has h parameters $h_{ie} = 800 \Omega$, $h_{oe} = 50 \times 10^{-6} \Omega$ $h_{fe} = 55$ calculate.
 - (a) Voltage and power of circuit.
 - (b) Express voltage and power gain in dB.
 - (c) Voltage and power gain if hoe is neglected.



- (2) Define cross-over distortion in class B amplifier and how it will eliminate ?
- (3) Define harmonic distortion.

6 Attempt any **three** :

15

- (1) Write a short note on RC coupled two stage amplifier.
 - (2) Power calculations in CE amplifier.
 - (3) Design a collector to base circuit for the $V_{CEQ} = 5V$, $I_{CQ} = 5 \text{ mA}$, $V_{CC} = 12V$ and $\beta_{dc} = 120$.
 - (4) Explain common mode rejections ratio in difference amplifier.
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