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**RN-6185**

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

**May / June - 2010**

**Electronic Devices & Circuits**

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

नीचे दशांशवैल निशानीवाणी विगतो उत्तरवडी पर अवश्य दधवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 2 (SEM. - 3) (ECC./EC/IC)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="ELECTRONIC DEVICES &amp; CIRCUITS"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="1"/> <input type="text" value="8"/> <input type="text" value="5"/>	Section No. (1, 2,.....) : <input type="text" value="1&amp;2"/>
Student's Signature	

- (2) Attempt all questions.
- (3) Assume data if necessary.
- (4) Figures to the right indicate full marks.

**SECTION - I**

- 1 (a) Attempt the following questions: 10
  - (i) Give the relation between  $\alpha$  and  $\beta$ . 1
  - (ii) Define 2
    - (a) Ripple factor
    - (b) form factor
  - (iii) Schottky diode uses semiconductor PN junction. 1  
True/false.
  - (iv) To get maximum symmetrical swing of output 2  
Q point should be placed \_\_\_\_\_.  
Draw graphically also.
  - (v) Draw circuit diagram only for different types of 4  
biasing methods.
- (b) (i) Compare different types of filters with circuit 5  
diagram.
- (ii) Why stability is required? Define stability factor 5  
for amplifier and derive the expression of stability  
for CE amplifiers.

2 (a) Describe the graphical method to obtain dynamic resistance of a PN diode with necessary circuit diagram and graphs. 8

(b) The CE transistor amplifier has  $\beta = 100$  and  $V_{BE} = 0.6V$ . The voltage divider biasing is used.  $R_1 = 3.3 K\Omega$ ,  $R_e = 300\Omega$ . Calculate  $R_2$  and  $R_c$ , so that  $I_{CQ} = 1 mA$  and  $V_{CEQ} = 2.5 V$ . 7

OR

2 (a) For full wave bridge rectifier with a filter derive the expression for  
 (i) Ripple factor  
 (ii) Efficiency  
 (iii) Regulation  
 (iv) TUF 9

(b) Determine  $V_E$  &  $I_E$  for the given circuit. 6

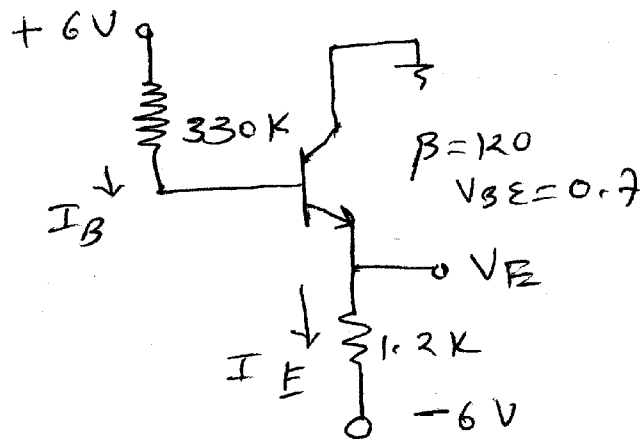


Fig.

3 Attempt any three : 15

- (i) Write a short note on diode capacitance.
- (ii) Effect of temperature variation on PN junction diode.
- (iii) Compare half wave and full wave rectifier.
- (iv) Zener diode as a voltage regulator.

## SECTION - II

- 4 (a) Attempt following questions : 10
- (i) The Q point of class A amplifier is located \_\_\_\_\_ . 1
  - (ii) The current gain of darlington is  $\beta =$  \_\_\_\_\_. 1
  - (iii) All the \_\_\_\_\_ harmonics are automatically cancelled in the push pull amplifier. 1
  - (iv) Multistage amplifiers are employed for having larger \_\_\_\_\_. 1
  - (v) What is the difference between voltage amplifier and power amplifier. 2
  - (vi) Explain impedance reflection in transistor. 4
- (b) Discuss the characteristics of darlington amplifier. 5
- (c) Classify different power amplifier. 5
- 5 Attempt any two : 16
- (i) For the  $S_i$  transistor in figure  $h_{fe} = 100$  and  $h_{re} = h_{oe} = 0$ . Find  $h_{ie}$ ,  $A_v$ ,  $Z_v$ ,  $Z_e$ . Also find  $A_i$  is the transistor amplifier is not used and load resistor of  $1.5\text{ K}\Omega$  is connected directly to input.

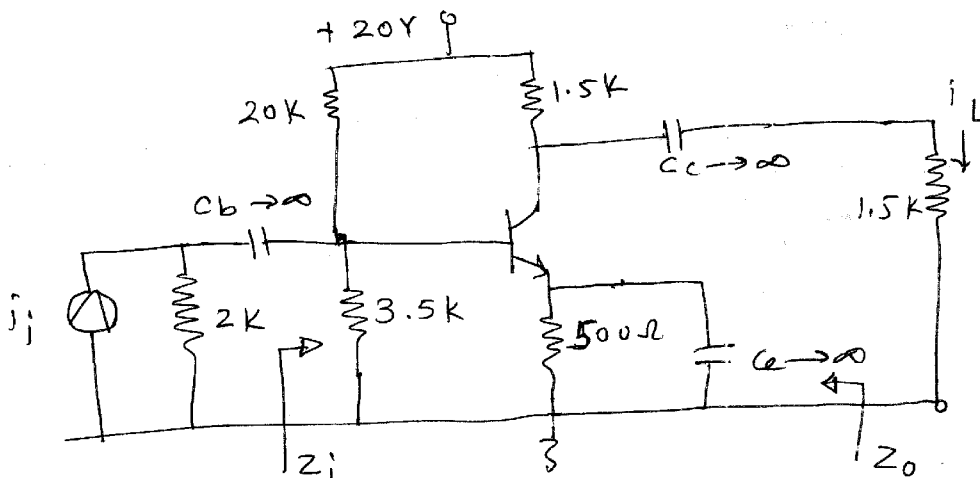


Fig.

- (ii) For the given circuit find  $A_v$ ,  $Z_i$ ,  $Z_o$ ,  $H_{fe} = 100$ ,  
 $h_{re} = h_{oe} = 0$ .

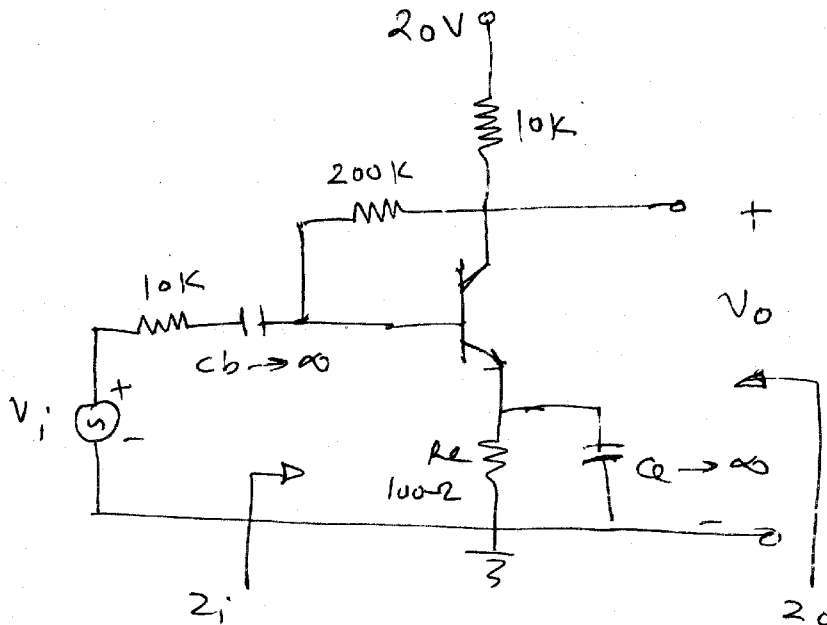


Fig.

- (iii) For transistor coupled class A power amplifier, maximum power of 5 watt is to deliver to the load with  $P_L = 4\Omega$ . The Q point is adjusted for maximum symmetrical swing and  $V_{CC} = 20\text{ V}$ . Find the turns ratio  $N$ , peak collector  $I_{cm}$  and efficiency.

6 Attempt any **three** :

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- (i) Cascade amplifiers, its advantage and significance discuss in detail.
- (ii) Write a short note on power calculations in CE amplifier.
- (iii) For common emitter amplifier draw circuit of an amplifier, its small signal equivalent circuit and derive expression for h parameter.
- (iv) Discuss different types of power amplifier circuits in brief. Also discuss the location of Q point for various power amplifiers.