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Question Paper Code : 30139

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Third Semester

Electronics and Communication Engineering

EC 3353 – ELECTRONIC DEVICES AND CIRCUITS

(Common to Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define break down voltage of Zener diode.
2. Draw the symbols of Diode, Zener diode, BJT and UJT.
3. Name the factors that affect stability of Q point of a Transistor Amplifier.
4. What is the need for biasing in Transistor Amplifier?
5. Mention the purpose of Differential Amplifier.
6. Find the Q factor value of a tuned circuit with resonant frequency of 1600 kHz and bandwidth of 10 kHz.
7. Define Piezoelectric effect.
8. Name a low frequency and high frequency oscillator.
9. What is a dc to dc converter?
10. Mention the operating point and conduction angle of Class A amplifier.

15. (a) With neat circuit diagram, derive the expression for output voltage of a buck-boost converter.

Or

- (b) With neat circuit diagram, explain the working of class AB power amplifier using MOSFET and state the advantages of using MOSFET over BJT.

PART C — (1 × 15 = 15 marks)

16. (a) (i) A voltage series negative feedback amplifier has a voltage gain without feedback $A = 500$, input resistance $R_i = 3 \text{ k}\Omega$, output resistance $R_o = 20 \text{ k}\Omega$ and feedback ratio $\beta = 0.01$. Calculate the voltage gain A_f , input resistance R_{if} and output resistance R_{of} of the amplifier with feedback. (6)
(ii) For the differential amplifier circuit shown in Fig. 16(a), assume β of both the transistors is very high. Find the value of V_{in2} for which current flowing through $2 \text{ k}\Omega$ resistor of transistor Q_2 is 1.8 mA . Assume thermal voltage $V_T = 26 \text{ mV}$. (9)

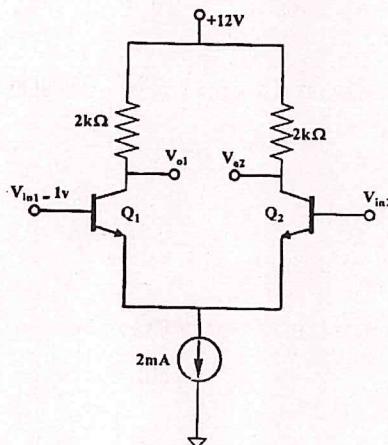


Fig. 16(a)

Or

- (b) In a Colpitts oscillator, the values of the inductors and capacitors in the tank circuit are $L = 40 \text{ mH}$, $C_1 = 100 \text{ pF}$ and $C_2 = 500 \text{ pF}$
- Find the frequency of oscillations.
 - If the output voltage is 10 V , find the feedback voltage.
 - Find the minimum gain, if the frequency is changed by changing L alone
 - Find the value of C_1 for a gain of 10.
 - Also, find the new frequency. (15)