

[This question paper contains 3 printed pages.]

Sr. No. of Question Paper : 1443 **F-7** **Your Roll No.....**

Unique Paper Code : 2511303

Name of the Paper : Electronics – Analog Electronics - I

Name of the Course : B.Tech. Electronics (Erstwhile FYUP)

Semester : III

Duration : 3 Hours

Maximum Marks : 75

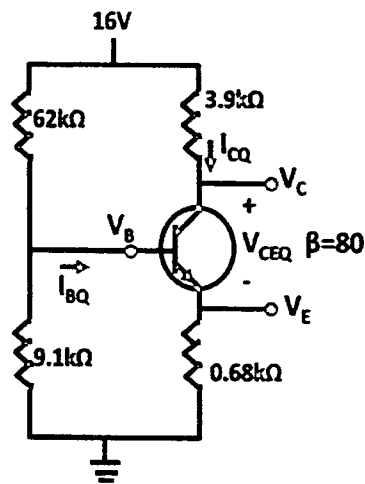
Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt Five questions in all
3. Question. 1 is compulsory.
4. Use of Scientific Calculator is allowed.

1. (a) Explain the Static and Dynamic Resistance of a Diode. (3)
- (b) Define current amplification factor β for common emitter transistor configuration. Establish a relation between α and β . (3)
- (c) A phase shift oscillator uses three identical RC sections in the feedback network. Using $R=100\text{ K}\Omega$ and $C = 0.01\ \mu\text{F}$. Calculate the frequency of oscillations. (3)
- (d) Differentiate between voltage and Power Amplifiers. (3)
- (e) What is Unity Gain Bandwidth? (3)

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2. (a) What are clampers? Give one application. Draw and explain the circuit of a biased negative clamper. (7)
- (b) Define ripple factor. Derive expression of Ripple factor for full wave rectifier and half wave rectifier. (8)
3. (a) With the help of Hybrid equivalent circuit diagram, derive the expressions of voltage gain for low and mid frequencies of a common emitter CE amplifier (8)
- (b) What is thermal runaway? (2)
- (c) Determine the operating point conditions of the transistor for the given figure



(5)

4. (a) Derive an expression for the maximum efficiency of a transformer coupled Class A amplifier. Compare it with the efficiency of Class A amplifier with a resistive load. (8)
- (b) Explain the concept of 'Cross over distortion' and how can it be overcome. (3)
- (c) Find the bandwidth of a single tuned amplifier. (4)
5. (a) Distinguish between positive and negative feedback. Give one application of each. (3)

- (b) Derive the expression for input resistance, current gain, voltage gain and output resistance for Voltage Shunt Feedback circuit. (8)
- (c) Calculate the input resistance, voltage gain and output resistance of Voltage Series Feedback amplifier with $A_v=750$, $\beta=0.1$, $R=1\text{ K}\Omega$ and $R_o=10\text{ K}\Omega$. (4)
6. (a) Explain in detail the working of Colpitt's oscillator and derive the expression of oscillation frequency. (10)
- (b) Explain Frequency Distortion and Phase Distortion on Power Amplifier. (5)
7. (a) Derive the expression of voltage gain for a common source JFET amplifier using small signal model. (7)
- (b) A class B push pull amplifier uses $V_{cc}=25\text{ V}$, $R_L=8\Omega$. If peak output voltage is 16 volts, what is the power drawn from the source? (4)
- (c) How are even harmonics eliminated in Push Pull amplifier configuration? (4)