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Reg No.:_____

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

Course Code: EC205

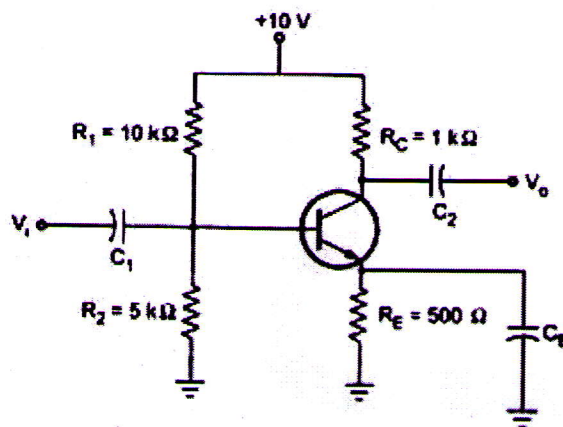**Course Name: ELECTRONIC CIRCUITS (EC,AE)**

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

1 a) For the given circuit $\beta = 100$ for silicon transistor. Calculate the operating points. Assume data that are not given.   (7)

b) With a neat circuit diagram, design a RC integrator circuit for an input frequency of $f = 1$ kHz.   (4)

c) Explain the concept of ac and dc load line.   (4)

2 a) Derive the condition for a high pass RC circuit to behave as a differentiator.   (5)

b) What is bias stability? Derive the stability factor for leakage current of a collector to base bias transistor circuit.   (7)

c) Obtain the transfer function for a low pass filter.   (3)

3 a) Draw the small signal hybrid Π model of the given circuit. Assume data not given.   (8)
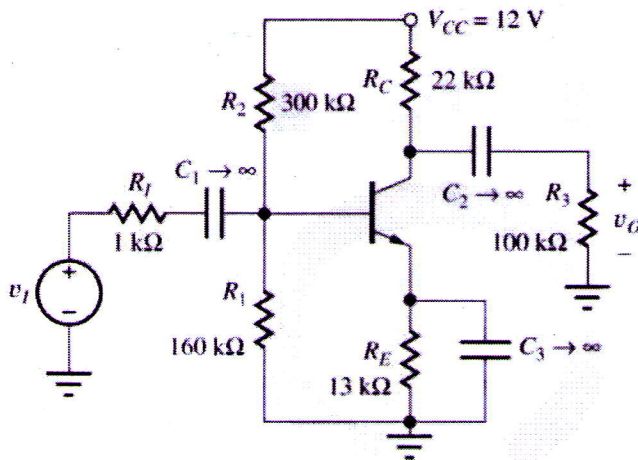
b) Derive the expression for voltage gain of a two-stage cascade amplifier. (7)

PART B
Answer any two full questions, each carries 15 marks.

4 a) What is Miller effect? (3)

b) From the high frequency equivalent circuit, derive the expression for beta cut off frequency of a bipolar transistor. Draw the frequency response for short circuit current gain. (9)

c) What are the conditions for sustained oscillation? (3)

5 a) Find mid-frequency voltage gain and output impedance of a CE amplifier without bypass capacitor using hybrid Π model. (7)

b) Draw the circuit diagram of cascode amplifier. (4)

c) Explain the working of an LC tank circuit. (4)

6 a) Draw the circuit diagram of a Hartley oscillator. In Hartley Oscillator $L_1=0.3$mH, $L_2 = 0,3$mH and $C=0.003\mu$F. Calculate the frequency of oscillation. (4)

b) What are different feedback topologies? Explain how the current series feedback effect the input and output impedances. (7)

c) Differentiate between synchronous and stagger tuning. (4)

PART C
Answer any two full questions, each carries 20 marks.

7 a) A class-B push pull amplifier working with V_{cc}=25V provides a 22V peak signal to a 8Ω load. Calculate the amplifier efficiency and power dissipated per transistor. (5)

b) With a neat circuit diagram, explain the working of a series voltage regulator with error amplifier. (7)

c) Draw the circuit diagram of a bistable multivibrator and explain its working with relevant waveforms. (8)

8 a) With neat circuit diagrams and waveforms, explain the working of a transistor bootstrap sweep generatorcircuit. What are itsapplications? (10)

b) Draw the circuit diagram of a class AB push pull amplifier and explain its working. (6)

c) What is cross over distortion in amplifiers? How it is solved. (4)

9 a) Draw the circuit diagram of a transistor shunt voltage regulator and explain its working. (8)

b) Differentiate between line and load regulations. (6)

c) Draw and explain the working of a Schmitt trigger. (6)

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