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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third semester B.Tech examinations (S) September 2020

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

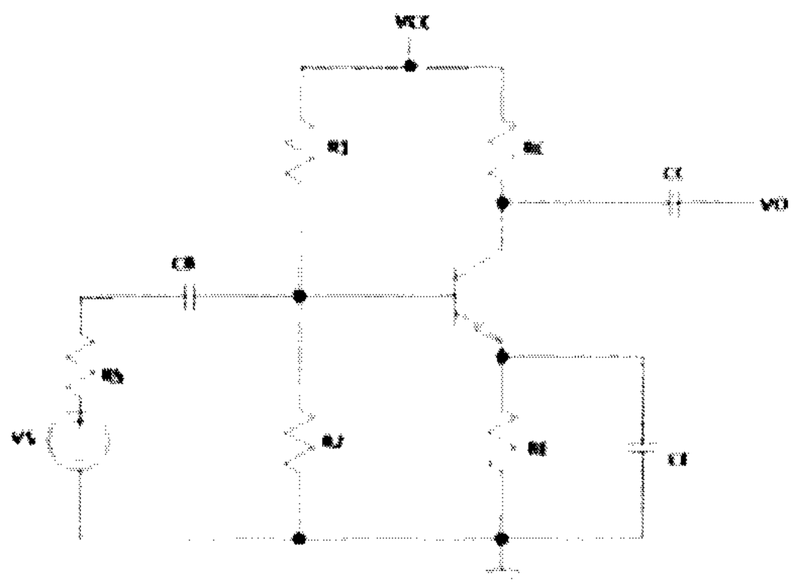
1 a) Derive an expression for current stability factor of collector to base bias. (6)

b) Plot the response of high pass RC circuit to symmetrical square wave input of 2V peak to peak, 20Hz. Given the cut off frequency of filter is 10Hz. (5)

c) Derive 3-dB frequency of a high pass RC circuit. (4)

2 a) Show how an RC circuit can behave as an integrator. (5)

b) Obtain the input resistance, output resistance and voltage gain of the given circuit using hybrid pi model. [Given Vcc=15V, R_S =1K, R_1=22K, R_2=15K, R_C=8K, R_E=2K, CE=CC=CB=0.01μF, β=100 and V_{BE}=0.7V]. (10)



3 a) Draw the circuit of a Common collector amplifier and derive the expressions for voltage gain and input impedance. (8)

b) What is the need for biasing and illustrate how Q point is fixed on a DC load line. (3)

c) Determine the stability factor of a fixed bias CE-BJT amplifier with V_{CC}= 12V, R_C=10K, R_B=5k and β=120 (4)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Explain the working of Wien bridge oscillator. Derive the expression for its frequency of oscillation. (10)

b) Given the transistor parameters as f_T = 600MHz at Ic = 1mA, Cμ = 0.5pF, β_0 = 100.Calculate the bandwidth f_β and capacitance C_Π of transistor. (5)

5 a) Discuss *any two* feedback topology. (6)

b) Derive the expression for upper cut frequency of a common emitter amplifier with voltage divider bias. (9)

6 a) Compare stagger tuned and synchronous tuned amplifiers. (5)

b) Draw the circuit of Cascode amplifier. Derive the expressions for midband gain and pole frequencies. (10)

PART C

Answer any two full questions, each carries 20 marks.

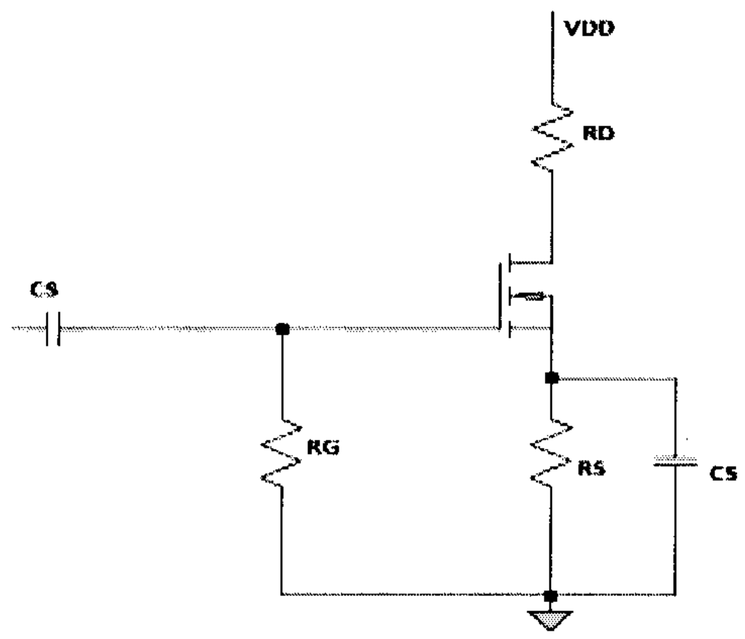
7 a) What do you mean by conversion efficiency of a power amplifier? (3)

b) Draw the circuit diagram of a class C power amplifier and explain its working with output waveforms. How a distortionless output is obtained in the collector of a Class C power amplifier. (8)

c) Explain the working of bootstrap sweep circuit with the help of neat circuit diagram and waveforms. (9)

8 a) Explain any two biasing techniques for enhancement MOSFET. (8)

b) Analyze the following circuit and determine a) operating points b) voltage gain. (12)
Given that V_{DD}=12V,C_S=10μF, R_D=2.2K, R_G=5MΩ, R_S=4K, I_{DSS}=9mA,V_p= - 5V.



9 a) Draw the circuit of astable multivibrator and explain its working with the help of collector and base waveforms. Derive the expression for its frequency of oscillation. (10)

b) Explain the working of feedback series voltage regulator. How do you provide short circuit protection in it? (10)

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