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Total Number of Pages: 02

B.TECH
PCEC4201

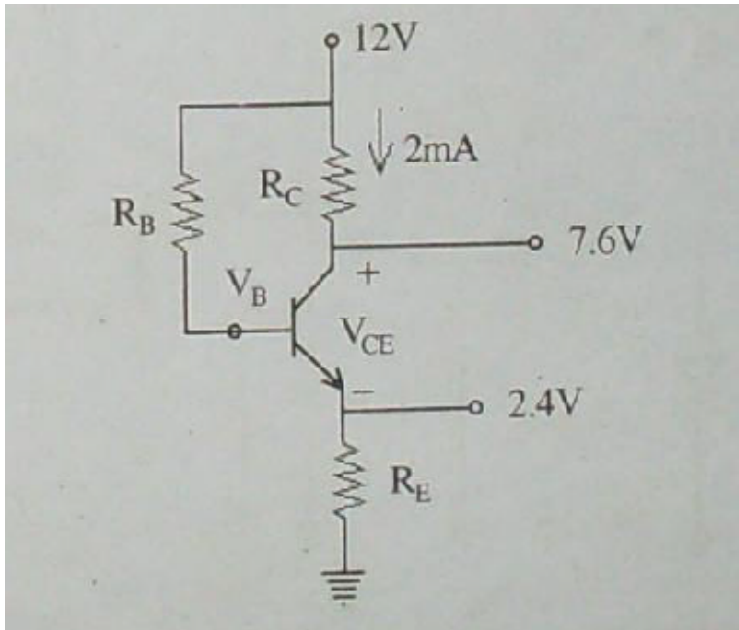
3rd Semester Regular / Back Examination 2015-16
ANALOG ELECTRONICS CIRCUITS
BRANCH: AEIE, BIOMED, CSE, EC, EEE, EIE, ELECTRICAL, ETC, IEE, IT
Time: 3 Hours
Max Marks: 70
Q.CODE: T625

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: **(2 x 10)**
- a) Why a fixed bias is called so? Justify.
 - b) An amplifier bursts into oscillation when the loop gain $AB=1$, but for sustained oscillation $AB>1$. Why so?
 - c) Which h-parameters one can determine from the input characteristics and the output characteristics of a BJT?
 - d) Give the load line of BJT amplifier if $V_{CC}=+9V$ and $R_C=1.8K$?
 - e) Explain the origin of crossover distortion? How can this be minimized?
 - f) What are the minimum values of gain in inverting and non inverting amplifiers?
 - g) Write Shockley's equation. How it is used to design d.c biasing of JFET?
 - h) What is better input buffer, a BJT or an FET? Justify.
 - i) Design an RC phase shifter that introduces a phase shift of 45 degrees.
 - j) What is the linear amplification factor of a transistor if its gain is 100?
- Q2** a) Consider a general feedback system with parameters $A=10^6$ and $A_f=100$. If the magnitude of A decreases by 20%, what is the corresponding % change in A_f ? **(5)**
- b) Explain frequency response of BJT amplifiers. **(5)**
- Q3** a) Find the input resistance, output resistance of an amplifier that employs voltage series feedback. **(5)**
- b) Derive the conditions of oscillation in a Wein-bridge oscillator. **(5)**
- Q4** Draw the circuit diagram of a class A transformer coupled power amplifier using an npn transistor. This amplifier drives a 16 ohms speaker through a 4:1 transformer, using a power supply of $V_{CC}=36V$, the circuit delivers 2 watts to the load. Calculate: **(10)**
- i) ac power across transformer primary
 - ii) ac voltage across the load
 - iii) the rms value of load current.

Q5 a)

(7)

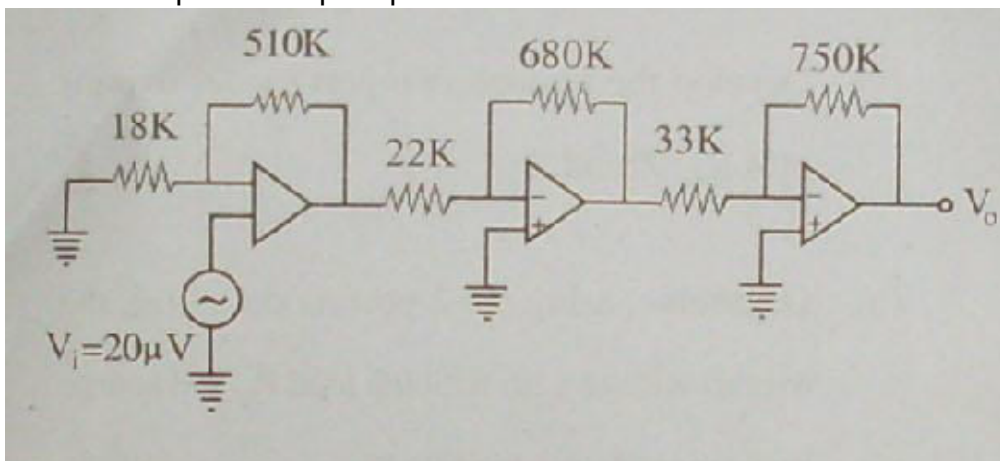


In the above circuit determine R_C, R_E, R_B, V_{CE} and V_B . The transistor has a $\beta = 80$.

b) Draw and explain the op-amp based differentiator. (3)

Q6 a)

(5)



Calculate the output voltage V_O of the above circuit.

b) List the characteristics of an ideal OP-AMP. What is CMMR? (5)

Q7

a) An n-channel FET has $V_{P} = -2.0V$ and $I_{DSS} = 1.65 mA$. It is desired to bias the circuit at $I_D = 0.8 mA$ at $V_{DD} = 24V$. Find V_{GS}, g_m, R_S and R_D . (5)

b) Draw an emitter follower or source follower circuit. (i) What is the type of feedback? (ii) Find the feedback factor. Find the voltage gain with and without feedback. (5)

Q8

Write short notes on any two: (5 x 2)

- a) Cascade and cascode amplifier.
- b) Summing Amplifier
- c) Emitter Follower Circuit
- d) 8:1 MUX