YILDIZ TECHNICAL UNIVERSITY

FACULTY OF ELECTRICAL AND ELECTRONICS ENGINEERING / DEPARTMENT OF BIOMEDICAL ENGINEERING

Name and surname:	**Student number:**			**Signature:**	
Course: BME2312 Analog Electronics	**Date / Time:** 26 May 2021 15:00			**Time:** 70 minutes	
Exam Type:	**Midterm1**	**Midterm2** x	**Make-up** for Midterms	**Final**	**Make-up**
Title Name-Surname: Assist. Prof. Dr. İsmail CANTÜRK **(Instructor)**					

1. Consider below single stage BJT amplifier circuit. The BJT is in active mode. Show your solution steps clearly and explain them. Also highlight your results (underline, encircle etc.). ($\beta = 100$, $V_{BE}(on) = 0.7V$, $V_T = 25mV$, $ignore\ r_o$)

a) Determine operating point of the circuit (I_C).

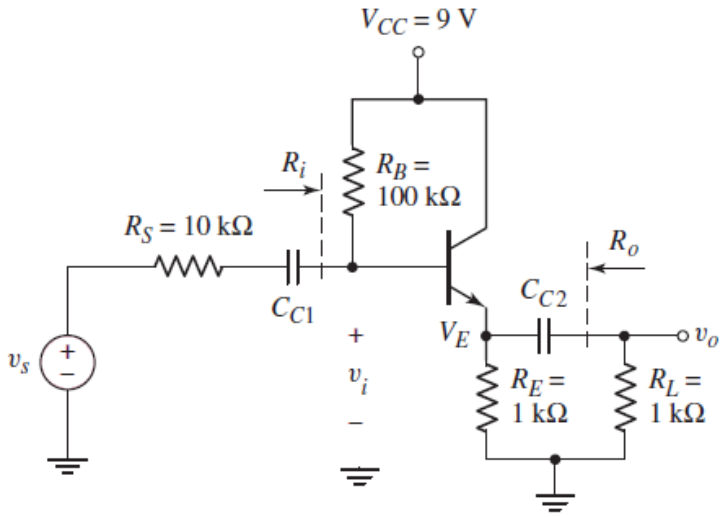
b) Draw small signal equivalent circuit (T model might be more convenient).

c) Calculate R_i .

d) Calculate R_o .

e) Determine voltage gain v_o/v_i .

f) Determine overall voltage gain v_o/v_s .



2. Consider below multi stage BJT amplifier circuit. The BJTs are equal and they are in active mode. Show your solution steps clearly and explain them. Also highlight your results (underline, encircle etc.).
$(R_c = 1k\Omega,\ \beta = 100,\ V_{BE}(on) = 0.7V,\ V_T = 25mV,\ ignore\ r_o)$

a) Determine operating point of the circuit $(I_{C1},\ I_{C2})$.
b) Draw small signal equivalent circuit (π model might be more convenient).
c) Calculate R_i .
d) Calculate R_o .
e) Determine voltage gain $^{v_{o2}}/_{v_{o1}}$.
f) Determine voltage gain $^{v_{o1}}/_{v_i}$.
g) Determine overall voltage gain $^{v_{o2}}/_{v_s}$.