

Final Assessment Test – November 2024

Course: BEEE205L - Electronic Devices and Circuits

Class NBR(s): 1252 / 8434

Slot: A1

Max. Marks: 100

Time: Three Hours

KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE

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- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions
(10 X 10 = 100 Marks)

1. Discuss the construction and working of full-wave bridge rectifier with proper circuit diagrams.
2. Consider the circuits shown in Fig.(1a) and Fig.(1b) with ideal diodes. If an input shown in Fig.(1c) is applied to them what are the respective outputs. Consider R to be very large.

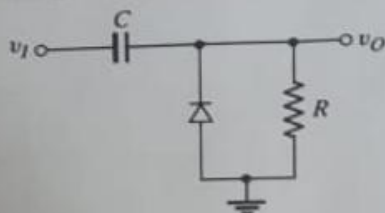


Fig.(1a)

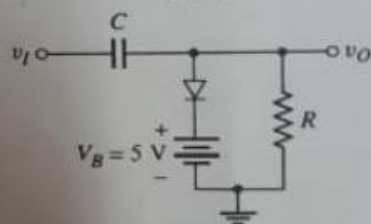


Fig.(1b)

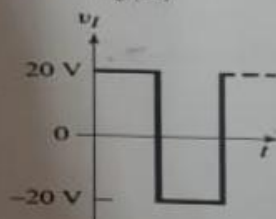


Fig.(1c)

3. For the circuit given in Fig.(2) solve for I_B , I_C , I_E and V_{CE} , given $\beta = 200$ and $V_{BE(on)} = 0.7V$.

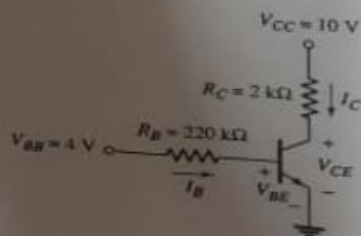


Fig.(2)

A transistor with $\beta = 80$, $V_{BE(on)} = 0.7V$ is connected in a common base configuration as shown in Fig.(3). The emitter is driven by a constant current source $I_E = 1.2mA$. Determine I_B , I_C , α , V_C and V_{CE} .

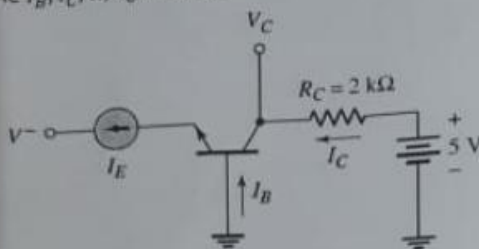


Fig.(3)

For the common base amplifier shown in Fig.(4), derive the voltage gain, input impedance and output impedance.

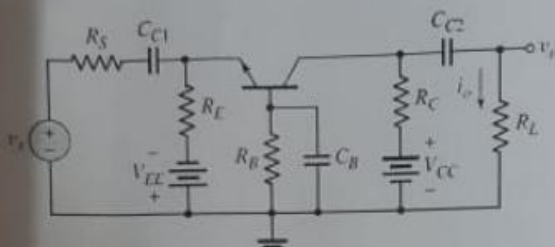


Fig.(4)

For the circuit shown in Fig.(5), $\beta = 100$, $V_{BE(on)} = 0.7V$ and $V_A = \infty$. Find the voltage gain A_V .

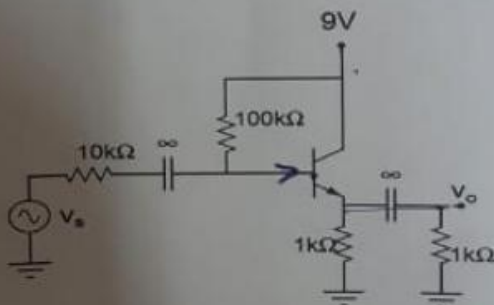


Fig.(5)

The parameters of the transistor are $K_n = 0.5mA/V^2$ and $V_{TN} = 1.2V$ for Fig.(6). Find V_{GS} and V_{DS} if $I_Q = 1mA$. What is the region of operation?

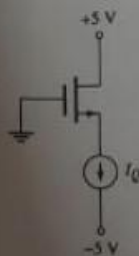


Fig.(6)

- 8/ Consider the amplifier circuit shown in Fig.(7). Derive its gain, input impedance and output impedance.

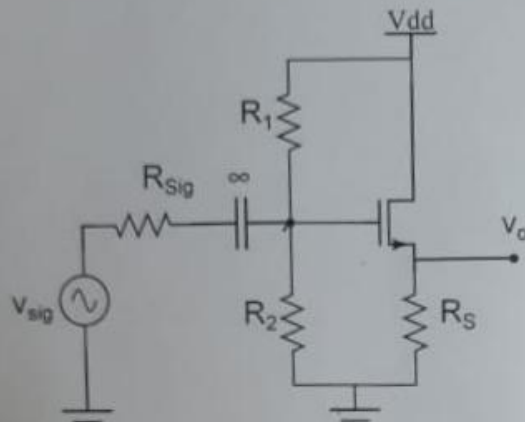


Fig.(7)

- 9.a) What is the impact of finite coupling and bypass capacitors in an amplifier circuit?

OR

- 9.b) What capacitors determine the high frequency roll-down in the amplifiers? Explain in detail.

- 10.a) With proper block schematic explain the negative feedback amplifier. What are the advantages of negative feedback in amplifiers?

OR

- 10.b) With proper block schematic derive the gain, input impedance and output impedance of the voltage series (voltage-in, voltage-out) feedback amplifier.

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