
Answer the following questions:

Q1- Draw and explain the normal and the Zener diode I-V characteristics , and one application for each one .

Q2- Determine the value of V_o for the circuits shown in Fig.1:

Q3-a- Explain the BJT amplification action

b- Derive how

$$\beta = \alpha / 1 - \alpha$$

$$I_E = (1 + \beta) I_B$$

$$I_{CEO} = I_{CBO} / 1 - \alpha$$

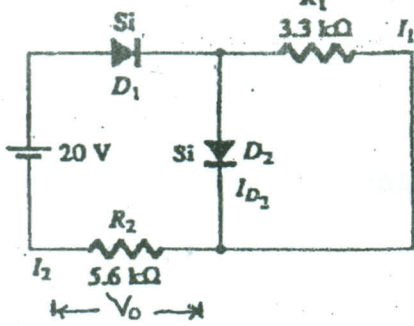
c- Explain How BJT common Emitter used as inverter

Q4- a-Determine I_E , and V_{CE} for the circuit shown in Fig.2 , if $\beta = 100$.

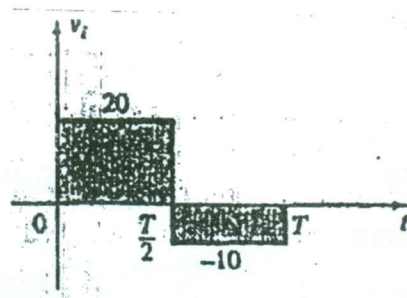
b- Determine $I_{C_{sat}}$ for the circuit shown in Fig.3.

Q5-a- Draw and Explain the structure and the operation of P-channel enhancement MOSFET.

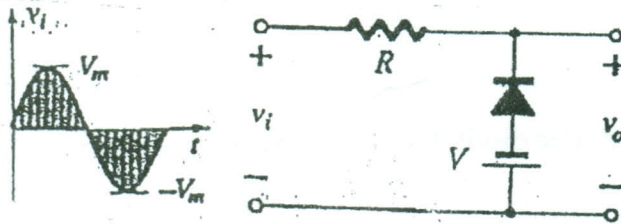
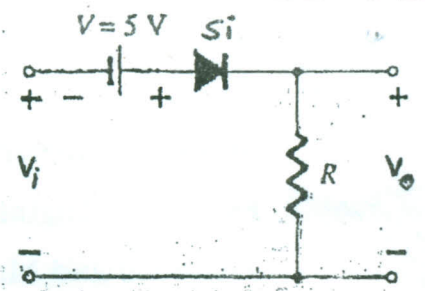
b- Determine I_{DQ} , V_{GSQ} , V_D , V_S , V_G , V_{DS} for the circuit shown in Fig.4. if $I_{DSS} = 10 \text{ mA}$, and $V_p = - 8 \text{ v}$.



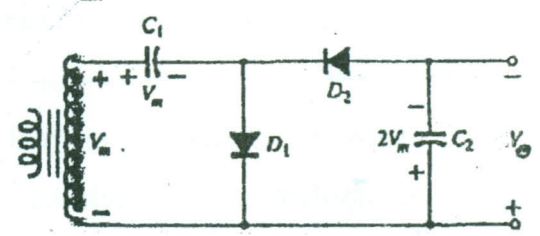
(a)



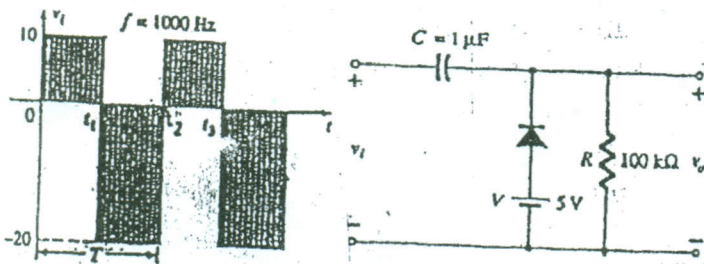
(b)



(c)



(d)



(e)

Fig.1

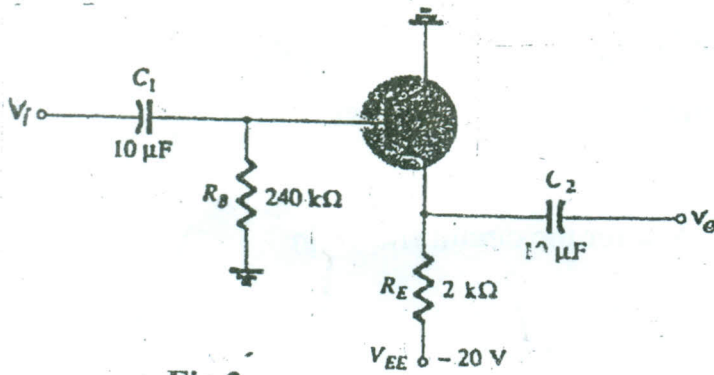


Fig.2

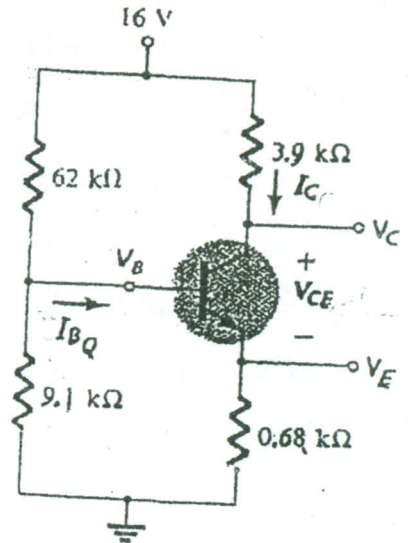


Fig.3

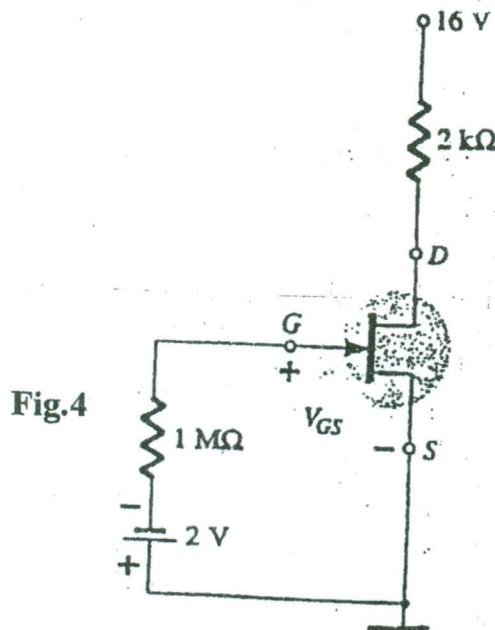


Fig.4